

Radio News,  
Reviews,  
Winter  
Shortwave  
Schedules

A Publication of  
Grove Enterprises, Inc.

# Monitoring Times

**What Would  
You Do?**  
*First on the Scene  
at a Motor Vehicle  
Accident*

**Gander Radio**  
*Guiding Pilots Across  
the North Atlantic*

**Mayans and  
More**  
*Shortwave  
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# Monitoring Times



## Antarctic Antenna Riggers

By Thomas Learned

8

Maintaining communication towers in the world's coldest, driest, and windiest continent requires a unique team of rugged individualists. One of them, Thomas Learned, takes us along as he climbs and inspects the towers and antennas in minus 10 degree temperatures in an altitude equivalent to 11,000 feet!

## First on Scene at an MVA

By Otto Muller

12

The night is dark. You are driving on a rural road, when suddenly the car you are following skids on a patch of ice and goes into a spin ... The Motor Vehicle Accident is probably the emergency situation most likely to be encountered by the ordinary citizen. Follow this imaginary account of how a volunteer fireman might have handled the incident. It could be you next time—or, you could be listening.



## Gander Radio

By David Lewis

16

Many shortwave utility listeners are familiar with the steady voices of Gander Radio, as its operators track aircraft traffic across the North Atlantic. Beyond the range of the usual VHF/UHF traffic control channels, these flights depend upon Gander to guard their safety and their communications on the long flight across the North Atlantic.

**COVER PHOTO:** The U.S. Antarctic Program Tower and Antenna Rigging Team erects a 110 ft. tower at McMurdo Station. Photo courtesy of Thomas Learned.



## DXing Shortwave from Central America

By Don Moore

20

If you're looking for an interesting source of shortwave signals outside the U.S., you don't have to look very far. Central America has quite a large assortment of shortwave broadcasters—some easy targets and some which pose more of a challenge. You'll find Mayans and more on this tour of the land below Mexico.

## The Ghost of Reginald Fessenden

By Everett Slosman

24

Around the turn of the century, Fessenden was a colorful and controversial figure, as he conducted his radio experiments in full view of the upper class summer homes in Brant Rock, Massachusetts. Never fully acknowledged for his major contributions to radio, today his ghost visits the airwaves on 95.9 MHz every Christmas Eve.

## And More ...

As the rate of technological development increases, you can almost audibly hear the age-old barriers being broken. The lines between disciplines and applied technology and even our senses begin to blur. Now it is becoming feasible for the hobbyist to see the audio signals he hears and to use that information in new ways. Two approaches are covered this month in a guest review of the Grove SDU-100 spectrum display unit (p.92), and in columnist Catalano's review of Pioneer Hill Software's audio analyzer (p.98).

The long-awaited Uniden BC 8500XLT scanner receives a mixed review from Bob Grove on p.94. Better read it before you buy.

Construction articles this month include a wrap-up of the broadcast band receiver begun last month in DeMaw's Workbench, and a circuit to safely charge your rechargeable batteries in Experimenters Workshop. Enjoy!

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### STAFF

#### Owners

Bob and Judy Grove

#### Publisher

Bob Grove, WA4PYQ

#### Editor

Rachel Baughn

#### Editorial Assistant

Beverly Berrong

#### Subscription Services

Chanel Cordell

#### Advertising

Beth Leinbach (704) 389-4007

#### Dealerships

Kelly Davis

#### Editorial Staff

Frequency Manager Gayle Van Horn

Frequency Monitors B.W. Battin

David Datko

Program Manager Jim Frimmel

Beginner's Corner T.J. Arey, WB2GHA

Plane Talk Jean Baker, KIN9DD

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## LETTERS



### How Tall IS It?

Okay, I admit it. I did not pick up the phone and call the station when we decided to make a cover shot of the photo Adrian Peterson sent us of what "he thought" was the tallest man-made structure in the western hemisphere. I knew I'd dropped the ball as soon as the issue hit the streets and we began to receive phone calls asking "How tall is it?" Several readers called KTHI-TV in North Dakota directly.

So, how tall is it? Not only does it measure 2,063 feet, but since the tall tower in Poland fell, it now holds the record as the tallest manmade structure in the world. The KTHI engineering department has amassed some interesting facts and figures to help the imagination grasp the size of this structure, which has been standing since 1964.

If a 20-second commercial started at the same moment a baseball was dropped from the top of the tower, it would have ended nearly four seconds before the ball hit the ground. If a hunter at the base of the tower were to shoot a goose flying near the top of the tower with a .45 calibre pistol, he would have to lead the goose by more than the length of a football field. In a 70-mile an hour wind, the top of the tower will move approximately ten feet.

Maintenance is made somewhat more convenient by an elevator in the center framework which travels up 1,948 feet. The remaining 115 feet has to be climbed. The antenna at the top is 113 feet high and weighs 9,000 lbs. Total weight of the tower itself is 864,500 lbs., and the guy wires are made up of 40,125 feet of cable!

### Corrections and Additions

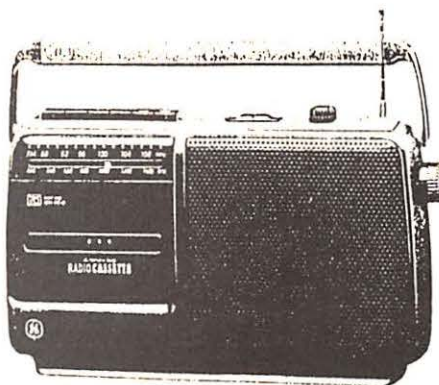
Contrary to the announcement inserted by editorial staff into Larry Miller's October "What's New" column, Grove Enterprises has not bought out the remaining supply of PRO-2006 receivers from Radio Shack. A Radio

Shack spokesman informed us that the PRO-2006 should be available through 1993 and possibly into 1994 through the normal outlets.

Monitoring Times has been informed that "comsat" is a registered trademark of COMSAT Corporation and cannot be used as a generic abbreviation for communications satellite. In fact, the company "was successful in halting the use of its name by the Department of Defense as a generic description for military communications satellites."

(Well, sure. Everyone knows those are "milsats," right? Wonder who has that one copyrighted?) So, it's back to the drawing board for terminology; watch for several excellent articles on satellite monitoring to be forthcoming in MT in 1994.

An interesting catalog of audio products from Canadian stations, which we mentioned in June's edition of "What's New," is the International Campus/Community Radio catalog. However, Lyle Stewart would like to correct the source that was given for the catalog. Instead of writing to CFLR Radio, it is available, free, from publisher La Bande Magnetique, 10 Ontario Ouest, #517, Montreal, Quebec H2X 1Y6 (514) 849-1392.



Bruce Elving, FM and SCA (sub-carrier audio) guru, responds to a question raised last July regarding the Lafayette "music-without-commercials" SCA radio. He says, "legend has it Lafayette was forced to stop offering the radio after encountering difficulty in getting the FCC to approve the new line"; a few sets were sold.

Elving's company, FMAtlas, "offers modified radios primarily to blind and ethnic services, and to hobbyists who are urged to obtain letters of permission from their local broadcasters to tune in. In no way do I promote listening for other than noncommercial-hobby purposes." Bruce has a supply of factory refurbished GE mono-cassette-FM-AM radios with a 67 kHz SCS board installed at \$65 plus \$6 shipping.

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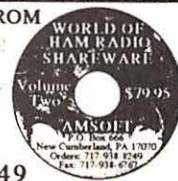
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read about it in  
Monitoring Times!



# LETTERS

When those are gone the price may go up; write him at FM Atlas, Box 336, Esko, MN 55733-0336; (218) 879-7676.

Elving correctly adds that an excellent alternative to *White's Radio Log* (mentioned in the low-power FM article in June) would be his *FM Atlas*, which shows station and translator locations. The book is available from the address above, or from Grove Enterprises and other advertisers.

• Robert Myers forwarded a list of eight suppliers of Nickel Metal Hydride (NiMH) batteries, which came from *SolarDex*, a resource guide for renewable energy and conservation sources (\$10 postpaid from 109 Fire Lane, Cape May, NJ 08204-3417.) Robert says the best price seems to be from Progressive Power in Denver, Colorado, and their batteries contain no cadmium at all. Space is limited, but here are the most promising of the names, with a phone number; call and ask these folks for their address and catalog.

Harding Energy Systems 616-798-7033  
House of Batteries 800-432-3385  
714-375-0222

Ovionics Battery Company 313-362-1750  
Progressive Power 800-873-7147  
303-761-5382

Quantum Batteries 800-237-6937  
619-438-2202

Real Goods Trading Company 800-762-7325  
707-468-9214

• In September's "Ask Bob," a reader asked about grayline propagation prediction without a computer. Roy Lavender of Long Beach, CA, has an interesting contribution to those SWL's who don't mind using a computer. "Merlin's Calends" is a very inexpensive program written by a Dutch pagan for use in astrologers and Celtic goddess worshippers."

"What the hey, it works, and it is accurate! I got local latitude and longitude by calling up the airport. The 1990 price was \$13 airmail overseas, but remember the dollar ain't what it used to be." Write Merlin, P.O. Box 473, 3700 AL Zeist, The Netherlands.

## Thanks for the Memories!

Because of the timing of this year's convention, we are not able to bring you the photo spread from the convention in October, but we promise we'll have pictures in December. However, we do want to acknowledge the exhibitors and dealers who made the convention such a success with their presence and their generous prize donations. They are:

### Exhibitors:

Advanced Computer Controls  
Aerial Development of New England

All Ohio Scanner Club  
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Radio Finland  
Scan\*Star  
Shortwave Paradise  
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SPEEDX  
Transel Technologies  
Universal Radio  
WILLCO Electronics  
Worldcom Technology

We owe an enthusiastic vote of thanks to those who donated prizes and put the icing on the cake for the numerous winners!

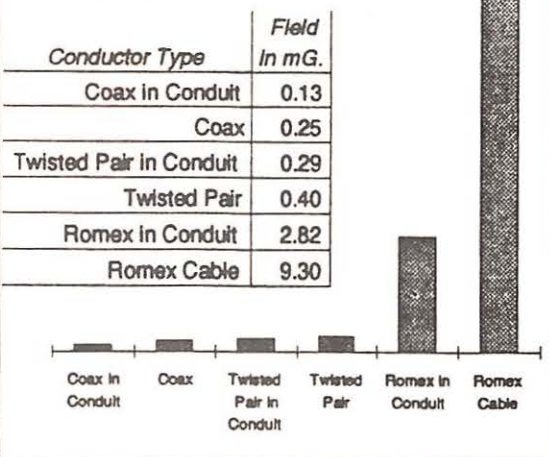
### Prizes and Donors:

Advanced Computer Control  
Software package  
Jacques d'Avignon  
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Christian Science Monitor  
Sangean MS103 receivers and speakers  
Chilton Pacific  
GE Superadio III  
R.L. Drake  
(2) MS8 speakers  
(2) Computer interface software  
Grove Enterprises  
(2) CVR4 Scanverters  
ICOM  
(2) R7100's  
(11) R-1's  
(22) jackets  
Optoelectronics  
(2) M1 frequency counters  
Radio Netherlands  
(3) First day commemorative stamps for  
Radio Oranje  
Worldcom Technology  
Action tape controller

## The Best Way to Get Wired

A question arose in the August issue regarding what type of house wiring a radio hobbyist

AC Magnetic Fields  
for different conductors  
2.5 Amperes at 120 vac



should use. Richard Balk of Sevierville, TN, sent a stack of pertinent information from *Home Power*, a publication about power generation and conservation which might be of interest to many MT readers (*Home Power Magazine*, PO Box 130, Hornbrook, CA 96044-0130; 916-475-3179). According to the graph, it would appear that twisted pair wiring in conduit is the best way to achieve the greatest reduction in ac magnetic fields.

The magazine adds, "Twisted pair wiring is easily accomplished by purchasing single conductor wire and twisting them together using a drill and vise. Even without the use of conduit, twisting the conductors together (about four to six twists per foot) reduces the magnetic field by over twenty times."

## Selected Shorts

• Congratulations to MT regular Gigi Lytle of Lubbock, TX, who received a phone call from Lifang on China Radio International informing her that she was a winner of the Hainan Cup Contest. If all goes well, Gigi will be on her way on a trip to China less than two weeks from now.

• "I would like to pass along a compliment to your communications magazine which is by any standard superior! Your new equipment tests are excellent and easy to understand for persons not 'electronically inclined.' Also, reviews are not sugar-coated to cover up a product's failings. The articles are well written and interesting. You might say your magazine gives 'more bang for the

*Continued on p. 111*



# 1994

What does the new 1994 World Radio TV Handbook have to offer you?

- High frequency broadcasting reception conditions.

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- Nearly 30 pages listing all the shortwave stations with addresses and names of key personnel.

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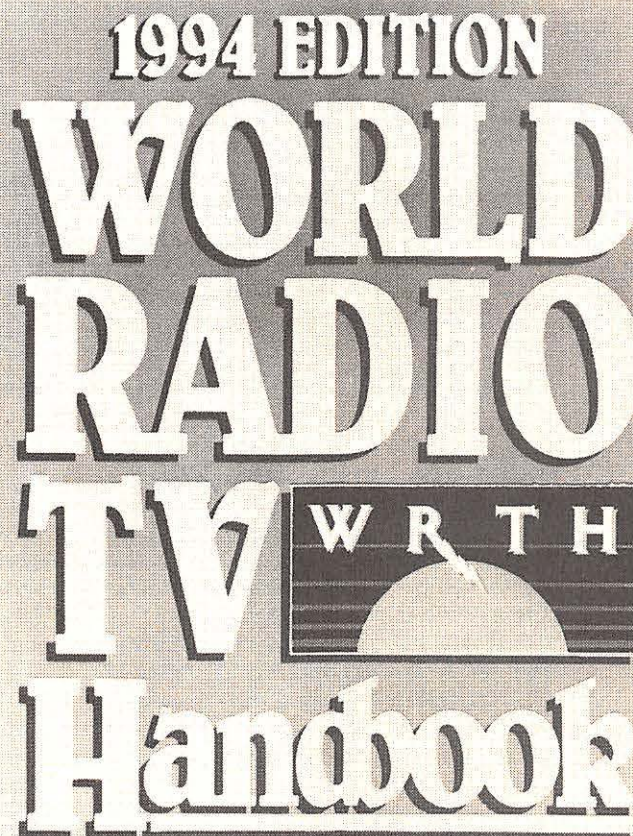
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## A Nose for News

When listeners tuned in to WIOV-FM in Ephrata, Pennsylvania, or WAGO-AM in nearby Sinking Spring, they always got the latest news. Unfortunately, according to a suit filed in Philadelphia federal court, the stations were lifting the news "almost verbatim" from the local newspaper.

The *Reading Eagle* filed suit claiming that WIOV and WAGO "willfully confused and misled the public into believing that [the stations] developed, reported and [wrote] local news stories broadcast on [the station]." They also pointed out that the newspaper employed 33 reporters, as well as 117 photographers, editors, researchers and related employees. The radio stations, they claim, have no reporters or editors.

## If You Dance to the Music...

Iranian TV is not known for being lively. So when the people began to grumble, the powers-that-be gave in and started a prime-time show called *After the News*. Compiled of jokes and skits, the show quickly took off, making its two hosts, Mahmoud Shahriari and Javad Atashafrooz, the hottest names in the country.

Then the two disappeared without explanation. The mystery was soon solved, however, when the Speaker of the Iranian parliament announced that the two had been fired. It seems that a film of a wedding party was shown in Speaker Majli's committee.

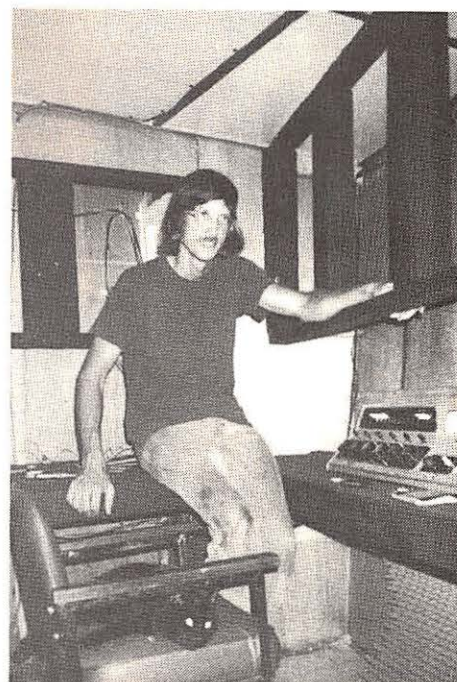
"I saw a familiar face among the gentlemen," said a shocked Ali Zadsar, who viewed the film. "It was a co-host of the *After the News* programme. He was wearing a tie. He started dancing. I felt shamed." The show's other host also danced, he added. Applications are now being taken for Shahriari and Atashafrooz's replacements. Interested parties should contact Islamic Republic of Iran Broadcasting, P.O. Box 19395-333, Tehran, Iran.

## On the Air: Cheap

Can't afford your own station? Now you don't have to. You can buy time on Radio Copan Internacional. And virtually anyone can afford the rates — \$25 an hour, \$12.50 a half hour or \$6.25 per 15 minute block. RCI transmits from Tegucigalpa, Honduras, on 15675 kHz and is the brain child of former Radio Earth host and co-owner Jeff White. To schedule your own shortwave radio show have your Mastercard or Visa ready and call 305-267-1728 or write Jeff White, 8500 SW 8th Street, Suite 252, Miami, Florida 33144.



*Above: The radio ship Fury in port being refurbished. Right: Allan Weiner begins construction of the Fury's broadcast studio.*



## Maritime Nevis Transmitter?

Radio Copan is first on the scene, but if all goes well, it will soon have some competition. Rumors have abounded regarding the ship Allan Weiner, president of Radio New York International, has been outfitting for shortwave broadcast. He sent some pictures to document the progress. The *m/v Fury* is being equipped with four transmitters capable of tuning any frequency between 2-28 MHz. Weiner says "We are trying out different types of antenna systems to make use of the reflectivity and tremendous conductivity of sea water. This will be a truly unique radio ship — the only one of its kind in existence."

A new company has been formed to direct the project — Voyager Broadcast Services (14 Prospect Drive, Yonkers, NY 10705; 914-423-6638). VBS will be leasing air time to individuals or organizations on three of their transmitters. The fourth is for the exclusive use of the Overcomer Ministry of Brother R. Stair, who is providing much of the financial backing to outfit the ship. In fact, regular *MT* reporter Gigi Lytle of Lubbock, TX, reported monitoring Rev. Stair's regular show on WRNO in which he asked for two listeners to donate \$10,000 apiece so that he can paint the ship.

Although the owners of the *Fury* are still trying to negotiate a "license agreement" with a Caribbean island, it reportedly has plans to sail in October, with plans to broadcast during the winter. If an agreement is worked out with the island of Nevis, this will be very big news in the DX community. Nevis has never been the site of a shortwave broadcaster.

## 1984

First came Channel One, the commercial television news program force-fed to school students around the country. Now, in the interest of forcing more ads down the throats of America's kids comes Star Radio. Star is offering to pay schools for the right to fill their halls with music and advertising directed at the lucrative \$80 billion teen market.

Unlike Channel One that broadcasts during homeroom period or during the first class of the day, Star Radio would be played in the halls between classes, during lunch, and before and after school — 12 hours a day. Star Director of Sales and Marketing Scott Plum points out gleefully that "Unlike radio advertising, students can't turn off the music and advertising filling their social, recreational and dining areas. Star is the ultimate marketing tool..."

## BBC: Lean and Mean and No Tea Ladies

The British public is continuing to snipe at the venerable BBC. After all, they claim, the programs are "dull and predictable" — not to mention the fact that each household pays a license fee of \$124.50 a year for the right to receive the service. So now, John Birt, the controversial BBC director-general, is going through the Beeb's expenses with a fine tooth comb. You'll be happy to know how the cuts were made: Says the *London Observer*, "gone



## COMMUNICATIONS

are the tea ladies, paid taxis home for late-night workers, clothing allowances and the allowance for soft shoes to be worn in recording studios."

Birt, apparently, is only willing to take the cuts so far. Birt himself, it was revealed, was just given a \$66,000 Range Rover in addition to his normal \$225,000 salary — probably with soft tires for driving around the studios.



### Freed By The FCC

The Federal Communications Commission has ruled (PR Docket 91-36) that states and municipalities may not enact ordinances forbidding amateur radio equipment simply because it receives frequencies normally reserved for police use. The ruling follows a five year effort by the American Radio Relay League to obtain a definitive ruling after several highly publicized cases where amateur radio operators were subject to arrest and seizure of their mobile equipment by local authorities for violation of so-called "scanner laws." The FCC made the determination after agreeing that there is a "strong federal interest" in promoting amateur radio and therefore determined that state and local scanner laws were preempted by federal law.

### Scanning for Cash

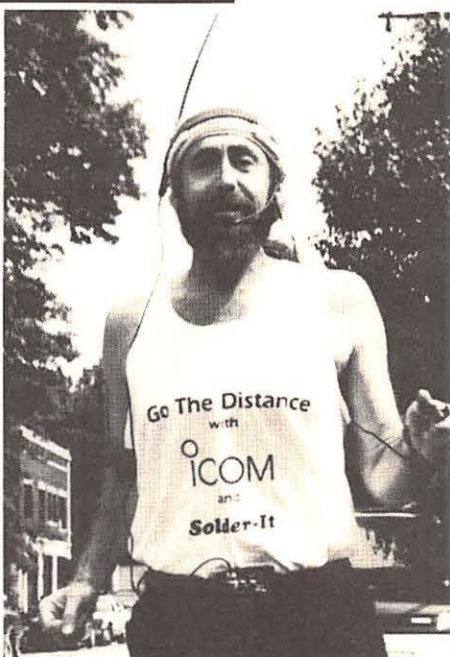
It seemed like a normal traffic collision in East Orange, New Jersey, when a bus, carrying 15 passengers, was hit from behind by a car. By the time an ambulance arrived at the scene, however, 17 additional people had scrambled onto the bus. All later claimed to have been injured in the accident.

However, not only were they not real victims; this was not a real accident. The "crash" was staged as a sting by the New Jersey Insurance Department. The "new arrivals" were filmed on camera; the NJID says that some use scanners to listen for just such an accident.

The *New York Times* says that lawyers have filed claims against the bus company's insurer for hundreds of thousands of dollars of treatments for injuries said to stem from the "accident." Many of the doctors have billed not only for office visits and treatments rendered, but also for many office visits that never took place.

### Scanning for Cancer

When the gun goes off for this year's New York City marathon Nov. 14, be sure your scanner is on and running. And instead of



listening for bus accidents to cash in on, punch in 146.88, 146.73, 147.36, 147.00, 147.24, 146.67 and 145.45 MHz. Fred Doob, AA8FQ, will be equipped with an Icom IC-W21AT handie talkie and he's hoping to talk to as many hams as he can during the race's 26.5 miles.

Why? Icom America has sponsored Doob and will be contributing \$5.00 to the Memorial Sloan-Kettering Cancer Center for every contact he makes along the route. Special commemorative QSL cards are being created for the event and Mr. Doob will not only be happy to respond to *Monitoring Times* readers who are hams, but has also promised to QSL shortwave and scanner listeners who send him a reception report as well. Here's his address: Fred Doob, P.O. Box 20100-A, Shaker Heights, Ohio 44120. **MT**

"Communications" is written by Larry Miller from a variety of sources — but not the *Reading Eagle* — including material submitted by the following Communications reporters: David Alpert, New York, NY; Jerry Davidson, Pennsauken, NJ; Bob Burdick, Meriden, CT; Anthony "Tony" Curtis, Hebron, MD; A.G. Halligey, Mid-Glamorgan, UK; Kevin John Klein, Appleton, WI; Ken Mason, Washington, DC; John LeMay, Saratoga, NY; Derick Ovenall, Wilmington, DE; Ira Paul, Oak Park, MI; Hal Rachubinski, Madison Heights, MI; Harry Rea, Portland, OR; Doug Robertson, Oxnard, CA and George Sala, Sr., Manheim, PA, plus The American Radio Relay League; Icom America; *National Scanning Report*; Summary of World Broadcasts Media (formerly BBC Monitoring Service), Voyager Broadcast Services, and the *W5YI Report*. Many thanks to all.

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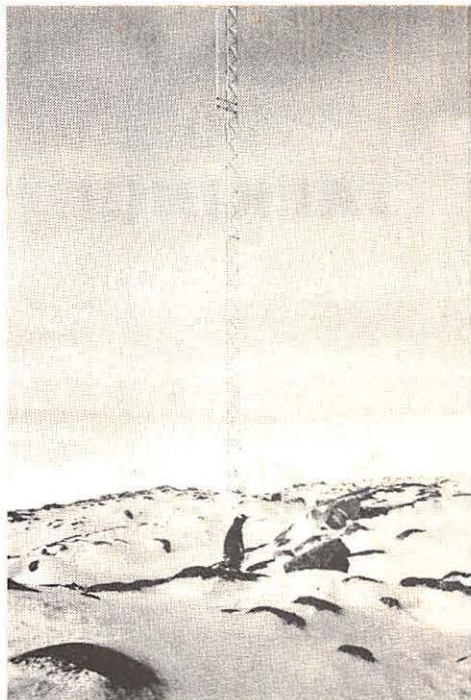
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# Antarctic Antenna Riggers

## *Braving the Heights at the Bottom of the World*

By Thomas W. Learned

The din of the C-130 penetrated even the soft foam earplugs and we awoke with a start when the engines changed pitch and the plane lurched upward. With a thousand miles of frozen ocean below, a soft landing in the event of a mishap was hopeless and the issued float suits seemed about as effective as a highway worker's orange safety vest in the -40 degree temperature.

These thoughts raced through my mind until the snarling beast of an airplane once again found its equilibrium and leveled out. I and five other civilian members of the United States Antarctic Program's Tower and Antenna Rigging Team resumed our fitful slumber amongst the cargo straps and vegetable crates. The nine hour flight south from New Zealand gave us

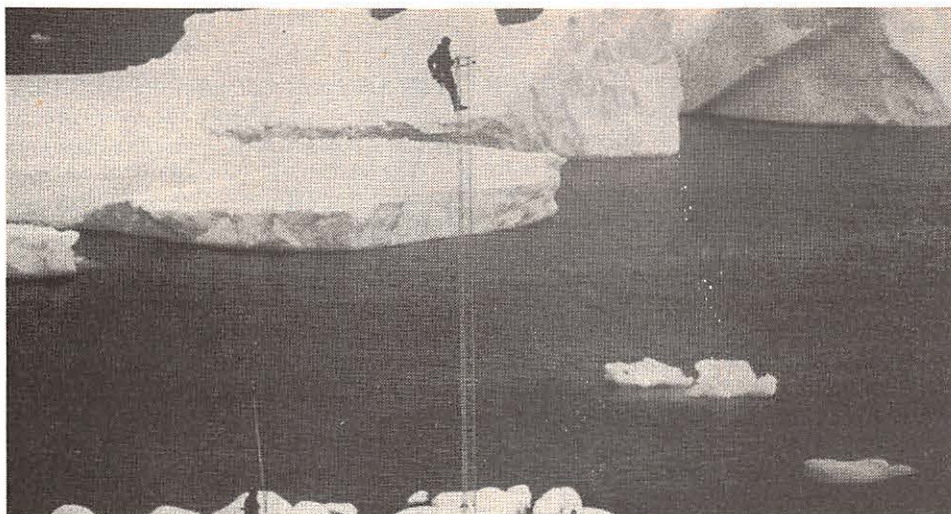
plenty of time to think about the adventures that lay ahead in the world's coldest, highest, driest and windiest continent.

Our task as the Antarctic Tower and Antenna Rigging Team was to erect and maintain the HF, UHF, VHF and satellite antenna communication systems. Our work jurisdiction included McMurdo Station, South Pole Station, Byrd



*This antenna tower at Palmer Station, Antarctica, stands amidst the rock and ice of the cold arctic. Above, an Antarctic resident stops by for a look.*





*Installing a new HF omni-directional antenna, Palmer Station, Antarctica.*

Surface Camp and at least four other remote field camps scattered throughout Antarctica.

The colorful characters that comprised our crew were Lee, Tom, Mario, Mike, Darrin, and myself. We came from all areas of the United States and our personalities reflected our origins. Mario and Mike both hailed from the East Coast and they bantered back and forth in friendly disagreement about everything. Darrin kept us entertained with his "You know you're from North Dakota when..." jokes, and Tom, with his neck crystals and new-age awareness was a fine representative of Colorado. Lee, a burly ironworker from Seattle, somehow mastered the art of constantly interjecting expletives into everyday conversation without sounding offensive. My own Minnesota upbringing allowed me a high tolerance to the near-hypothermic temperatures of Antarctica.

Five hours into the flight, we were past the point of safe return. We were committed to landing in Antarctica regardless of the weather conditions on the ice. Pilots have described it as flying in a bowl of milk, and the weather ahead proved to be no exception. The pilot was kind enough not to elaborate on the horrible conditions that McMurdo Station was experiencing. During the last two hours of the flight, the weather had deteriorated badly at our destination, but turning around was out of the question for lack of fuel. Surface winds on the ice shelf were approaching 60 knots. A full blown antarctic blizzard had blotted out our runway. With the crash and fire crews mobilized, we safely touched down in zero visibility, much to the credit of the U.S. Navy pilot.

I stepped off the plane into the raging blizzard to begin another six months of adventure, confinement and isolation in the world's harsh-

est wilderness. My summer conditioned body immediately rejected the minus 40 degree temperature and screaming wind. Struggling along the ropes to the waiting vehicles, I came up with several good reasons to get back on the airplane.

Our first assignment at McMurdo station was to demolish and replace 12 one hundred foot tall towers that were part of their HF rhombic antennae. Since the month of August can be the worst in Antarctica with the windchill dipping to the minus 100 degree range, we spent our days organizing and transporting tower sections and antenna material. The McMurdo antenna site is located on a barren windswept plateau above the station. Volcanic in origin, the site is covered with craggy rocks and boulders which taxed our four wheel drive vehicle. Snow drifts buried rocks and holes, and getting stuck with our loads of supplies was a common occurrence.

By the time October came, the sun was visible 24 hours a day, the temperature had warmed up to the -20 degree range and we were well acclimated to the cold. The site was stocked with all the supplies and we were ready to start. A coin was produced for the toss. The lucky winner, Lee, was awarded the bolt cutters for the first chop. There is a morbid sense of delight in watching things get trashed, and when the bolt cutters chewed through the tower guys, we giggled like school children as the tower crashed to the ground. A strong urge pervaded to continue demolition and extend it to all the towers in sight. Fortunately, common sense prevailed.

After the piles of old tower sections were cut apart with a torch, the job of making guy cables began. A spool of cable was set up, distances were marked for the insertion of the break-up guy insulators and the insulators and guy grip preforms were laid out accordingly. Since

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making guy cables can be compared to tying your shoe over and over again; the monotony was relieved by putting our backs to the unrelenting wind, cranking up the tunes on the boombox and diving into it. Often, colorful conversations ensued as we each took turns offering our philosophies on life.

When all the tower sections were put together and the guy cables attached, a crane was summoned to stand the towers. To our relief, the operator that was sent was a tobacco chewing curmudgeon named Dick. Overweight and nearing retirement age with arthritic knees and a bad back, one could not help but wonder who took his physical exam for him. It pained us to watch

him climb in and out of his crane. However, Dick had an uncanny ability with anything that had cables and levers and he was truly a master at his craft. When you're 100 feet or more in the air, there is no room for error and the operator has to give you exactly what you need. Dick did just that. Only problem with Dick was, you had to time your crane signals in between chews of Copenhagen.

By the time the end of November came, we had demolished and restored three HF rhombic antennae and it was time for our yearly stint at Black Island. Located 25 miles directly south of McMurdo, Black Island is where McMurdo Station maintains their receive site. It is also one

of the windiest locations on Earth. The wind keeps Black Island stripped of snow even though the island next to it is covered with ice and snow.

The location of the island is such that the katabatic winds that roll off the polar plateau get funneled right into it by the surrounding glaciers and mountains. The winds can blow with hurricane force, unrelenting for days at a time. With the composition of the island being volcanic ash, at times it is like walking in front of a sandblaster. On the other hand, when the wind is calm, it can be one of the most quiet and tranquil locations on Earth. During the calm times, the only sound you hear is the whoosh of blood rushing through your ears with each heart beat.

Two out of the three weeks we spent at Black Island was calm, and our maintenance work proceeded without a hitch. During the week that the wind blew between 70 and 100 knots, a typical day went like this:

"Which VCR tape should we watch now?"

"Let's watch Goldfinger."

"We just watched that one."

"Yeah, but that was over three hours ago."

The trick to coping with sheer and utter boredom was to seize whatever moment you were in and live for that one alone. Left to our own devices, we even tossed out the normal starting time of 7:30 am and practiced organic awakening. This simply means go to bed whenever, wake up whenever. With brilliant 24 hour sun and a normal sleep metabolism long since destroyed, nowhere to go and no one to bother us, the incentive to stick to a routine was out the window.

After doing the structural maintenance and required antenna performance checks, it was time to depart our peace and relative tranquility at Black Island and head to South Pole Station. If there ever was a peek into what it would be like to live in an ice age, South Pole is it. Absolutely flat and featureless, the terrain looks much like an ocean that has been flash frozen. Devoid of natural life, Sir Robert F. Scott summed it up best when he wrote in his diary after his long march to the South Pole, "God what an awful place."

Our task was to climb and inspect all the towers and antennae at the station: no easy task when the dog days of summer bring you minus 10 degree F. temperatures and the altitude is equivalent to 11,000 ft. Just getting dressed in the morning can be a workout. The tallest tower at the station is 160 ft. high and is a support of their HF rhombic antenna to McMurdo station. Climbing that tower with my tool belt on and dressed in layers of cold weather clothing was torturous in the rarified air. After arriving at the top, I was relieved to find the components and hardware were in excellent shape. That meant



*Updating the HF rhombic antennae.*



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I wouldn't have to climb it again until next year. Happily, I clambered down and was off to inspect the other 12 towers on station.

Fortunately, the cold weather and relatively light winds at South Pole Station acted as a preserving deep freeze on the antennae components and there was no major maintenance to be done. It was time to bid adieu to one of the coldest and driest regions on Earth. Looking like overstuffed red pillowcases in our cold weather clothing, we waddled toward the waiting C-130 airplane for the three hour flight north to McMurdo Station.

The height of summer at McMurdo Station was a welcome relief from the cold of the antarctic plateau. Melt water was running in muddy streets and parkas were shed in favor of woolen shirts. The town resembled a mining camp rather than a polar outpost. Temperatures hovered just above the freezing mark and Old Man Sol continued his 24 hour endless circular sojourn.

With our tasking for the year nearly complete, all that was left was to replace the last rhombic antenna, the Christchurch-McMurdo HF link. After five months living and working together, the rigging team had the fine art of tower rigging down to a science. With the weather

much more cooperative, we dove into the demolition of the old antenna and had it totally replaced in one week, replete with all new anchors, towers and antenna wire.

We devoted our last few weeks in Antarctica to a final inspection of all the antennae we had installed and an inventory of remaining supplies. Time was winding down and we were due to leave soon. The temperatures began their downward spiral after an all too brief antarctic summer. The "real world" was only a couple of weeks away for us. Half the antenna crew was to deploy to New Zealand to maintain the HF antarctic communication site in Christchurch, and three of us were to deploy to Palmer Station on the antarctic peninsula. I was scheduled to leave McMurdo Station on the visiting Russian ship, the *Professor Zubov*. The ride turned out to be an adventure in itself, but that's another story.

After spending a total of three years in Antarctica at several locations, I have gained more than a few great pictures and memories. I have a better understanding of why the early explorers literally carried each other out while fighting death themselves, only to return time

and time again. From savage storms whose fury is unknown anywhere else on Earth, to beautiful and gentle creatures who eke out a precarious existence on the shores of a barren and hostile land, Antarctica is a siren's song whose secrets we are only beginning to unlock.

If you would like to tune in and listen to some of the radio traffic of the United States Antarctic Program, from remote field parties to aircraft and station operations, the following is a list of HF frequencies to which anyone with a short-wave receiver can tune:

- 4997 MHz (field parties)
- 8997 MHz (aircraft)
- 11553 MHz (station to station)

Listen for these amateur and MARS radio callsigns from the U.S. Antarctic stations:

Station	Amateur	MARS
Byrd	KC4USB	NNN0NUZ
McMurdo	KC4USV	NNN0ICE
Palmer	KC4AAC	NNN0NAA
South Pole	KC4AAA	NNN0NWB

MT

*Editor's Note: See Jan. '92 MT feature for callsigns and frequencies from many other Antarctic stations.*



*The motor vehicle accident (MVA) is a common emergency, calling on fire, rescue, ambulance, police and sometimes air evacuation agencies. It is also the emergency most likely to be encountered by the ordinary citizen. Chances are pretty good that at some point in our lives many of us will arrive at an MVA before emergency personnel do.*

*By listening to our radios we scannists can prepare, to a degree, to respond appropriately if we find ourselves first on the scene at such an incident. The scenario which follows illustrates typical priorities and procedures at an MVA. It describes what transmissions might occur, and what actions might be going on, if a volunteer firefighter were to come across a two car collision out on a rural highway.*

## First on Scene at an MVA

*By Otto H. Muller*

**I**t is a night made for "Black Ice." The temperature is below freezing now, but had been warmer during the day. Meltwater spreads across the highway from snow piles on either side. Where it had been salted heavily, and the flow of meltwater had been reasonable, the road retains enough salt to keep the water liquid. But where flowing rivulets had flushed away the salt, water is freezing onto the pavement. Drivers, finding that several glistening patches are just wet, might relax their vigilance only to find that the next one is slippery ice.

John respects the "Black Ice" which results, but he knows that other drivers might not. The country road he is on runs down a valley next to a creek, and freezing spray from the creek adds to the risk.

After rounding a curve in the road, John sees a car turned sideways to the road, blocking his lane and half of the other one. Ignoring the wrong impulse to step on the brakes, John downshifts quickly, slowing his car but maintaining control as he avoids the late model Detroit car. He downshifts again, then applies his brakes and pulls over onto the shoulder. Only after he stops does he

look into his mirror and see the truck which had been following him. It had plowed into the car broadside, in what the folks in his department would call a "T-Bone." His mind starts in on a well rehearsed litany of appropriate actions:

**First, stabilize the scene.** He turns on his four-way flashers, sets his brake and turns off the engine. Taking his flashlight and portable radio with him, he gets out, goes to his trunk and takes out several flares. He heads up the shoulder, away from the wreck, to where oncoming traffic would be able to



Mark Swarbrick





David Clark Inc.

see his flare and slow down safely. On his way he calls the Emergency Control Center for the county, using their Channel #1 frequency.

"Control, this is Lt. Kelson of the Eagleville Fire Department."

"Control on for Lt. Kelson."

"I'm on the scene of a two car MVA on county road 73 about two miles east of the intersection with Route 9. Will advise on injuries."

"Control copies: two car MVA on county road 73, two miles east of 9."

Lighting the flare, and setting it into the shoulder, John hustles back down the road to the wreck. He stops for a second, shouting to the occupants of both vehicles, "Sit still, I'm going to help you, just don't move, please, for a few more minutes..." And then he goes on down the road and installs another flare for traffic coming that way. Satisfied that he has stabilized the scene, John goes back to stabilize the wreck.

In the meantime, the dispatcher at the control center is calling a county sheriff unit and the state police patrol to get them to respond to the scene. The treacherous highway conditions are keeping all police agencies busy, and the nearest car will still need fifteen minutes to reach the scene.

Next on the dispatcher's list is the Eagleville Fire Department. Some of the members have already begun to respond. Many habitually monitor their scanners, and others leave their pagers set to monitor Channel #1. Over the years most of these people have developed an uncanny ability to "tune out," mentally, most of the chatter coming across the airwaves, but to pick up on anything relevant to their operations. John's transmission, particularly his voice, cut through whatever they'd been doing, and caught their attention immediately.

Reactions vary, but those who hear it start preparing to respond. Some turn off the stove they are cooking on, others warn their kids that they'll be going out, and others put on their bunker pants and start toward the fire station. By the time the tones actually come

over, enough people are on the way to the fire station to get a rig out, maybe two.

The first pair of tones triggers the beeping signals in those pagers which had been off, alerting the rest of the department to the situation. The second pair of tones triggers the siren on top of the Fire Station, effectively alerting everyone in its vicinity that some sort of emergency is in progress.

"Eagleville Fire and Rescue: You have a two car MVA on county road 73, two miles East of Route 9. Unknown if Personal Injury."

Sharon Mosher, who had been in the station doing some of the groundwork for an upcoming fundraiser, is already at the base radio. "Eagleville Base acknowledges the call."

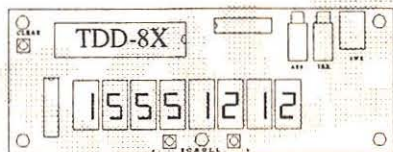
"Eagleville acknowledges, 21:39." As it does on many of its transmissions, Control appends the time at the end. All traffic is tape recorded, and these time marks could

help re-create the incident to improve the response the next time.

John checks over the wreck, critically. His concern at this point is still risk. He knows it is important to assess the likelihood that the situation might deteriorate, putting himself and the accident victims at increased risk. Downed power lines, unstable vehicles which could roll over, leaking gasoline — all sorts of hazards are possible. His inspection indicates that things aren't likely to get a lot worse anytime soon, and so he sets about stabilizing the last element — himself.

Taking a couple of deep, cleansing breaths, he gives himself a quick confidence building pep talk as he approaches the crumpled metal lodged across the highway. A volunteer firefighter with ten years of experience, John has seen plenty of wrecks. Never very interested in the medical end of things, he'd taken only a basic first aid course, and that had been years ago. Still, he

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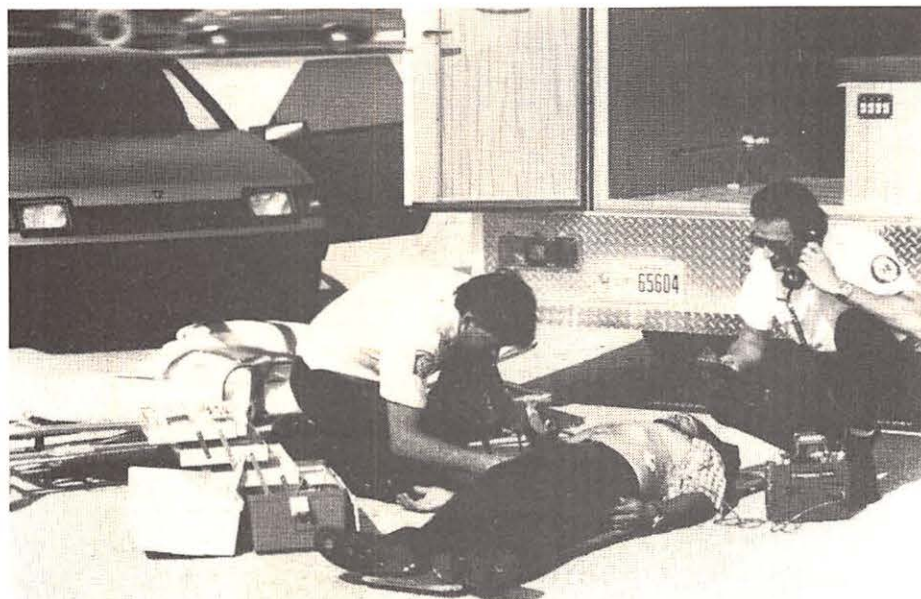


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knows what NOT to do, and he is certainly better than no help at all.

The engine compartment of the pickup truck had collapsed, but there were no "spider-webs" on the windshield. The light from his flash reveals two occupants, sitting there as he had instructed, and both turn slowly to look at the light coming in the side window. John shouts, "Are you OK?," and sees the driver try to say no. "Just sit tight, I'll be right with you..." John yells, and goes over to the sedan.

Its passenger side is caved in, the driver the only occupant, who tells him, "I'm all right, I'm fine. Can I help? What should I do?"

"Just sit tight, don't move. Help is on the way." And John goes back on the air with his portable. "Control, this is Lt. Kelson." "Control on for Lt. Kelson."

"Control, this is a serious personal injury accident. Three victims. Looks like extrication will be necessary for two of them."

"Control copies: Serious PI, three victims, extrication required. 21:42. Should we alert Air-Evac?"

"Affirmative, Control."

In a minute, the dispatcher is broadcasting more tones. Three victims means three ambulances, which means mutual aid from adjoining fire or ambulance districts. The Eagleville Fire Chief, hearing his lieutenant calling for extrication, comes on the air to request the jaws from Marsfield. Alerting these departments, hearing them acknowledge and go out of service to this call, and then announcing when they arrive on the scene, will occupy much of Channel #1 for some time.

In the meantime, the Eagleville Chief wants to talk with John on Channel #2, but utilizes Channel #1 to reach him. "Lt. Kelson, this is Eagleville one-five-oh."

However, John Kelson is busy. His portable lies on the road beside the front

wheel of the pickup, and he is taking pieces of the shattered window out of the passenger side door. He is talking. **He knows not to move anyone**, not to let them move, if possible, and to reassure them as best he can. He chatters on and on, sticking his head through the hole he's produced in the window, reaching in to take the pulse of the passenger. Relieved to feel a strong pulse, he reassures her that help is on the way, pulls himself back out of the window, picks up his portable and moves around the truck to the driver's side.

"Kelson on."

A terse instruction from his chief, "Go to two," and John switches channels. As soon as he does, he gets asked, "What have you got?"

"T-Bone, three adults, two hurt, not sure how bad. Just before the Browns' farm."

"We're about six minutes out. Can you advise on injuries?"

"No. Proceed with caution — Black Ice. Kelson on."

Before putting his portable down again, John switches it back to Channel #1. He knows that anyone wishing to reach him will try that frequency, and it permits him to listen to the units responding.

"Control, this is Air-Evac One."

"Control on for Air-Evac One."

"Negative on our response, we're grounded by the weather."

"Air-Evac One cannot respond, 21:44. Control to One-Five-Oh."

"One-Five-Oh, on."

"Chief, negative on Air-Evac. We have ambulances responding from Marsfield and Chamberlain, plus your ambulance. Should we start anyone else?"

"Negative."

The driver's door of the pickup is distorted, but finally yields to John's determined tugs. His flashlight reveals that the man's right foot is trapped within the pedal cluster. John talks to him, reassuring

him, instructing him not to move, and asking where it hurts. Not surprisingly, the man replies that he has considerable pain in his foot and ankle, and then inquires about the passenger car. When John tells them that there's one person, who seems to be OK, the relief is almost palpable.

"Control, One-Five-Oh on the scene."

"One-Five-Oh, scene, 21:46."

The chief drives somewhat past the accident before parking and walking back, portable in his hand. His concern is managing the "big picture," which right now means placing the emergency vehicles where they can work most efficiently. He gets a quick briefing from John, "This guy's caught in the pedal cluster, she isn't complaining of anything, and the guy in the car says he's fine."

Using Channel #2, he communicates with his rescue truck.

"One-Five-Oh to One-Five-Five, on Two."

"One-Five-Five on."

"Looks like the driver of the pickup will need to have his foot extricated from the pedal cluster. Pull way over to the side of the road, right in front of it."

"That's affirmative", and then switching to Channel #1, truck 155 transmits, "One-Five-Five on the scene."

"One-Five-Five, scene, 21:47."

Next an ambulance arrives and disgorges its crew. The crew chief gets a repeat of John's briefing, and starts issuing orders to her people. A fire engine arrives as a precaution, and parks a little way up the road. Soon rescue and medical personnel are working in three clusters, around the three patients. Getting vitals, administering oxygen, and checking carefully for injury before moving any of them, they finally get two of them into waiting ambulances, and head off for the hospital.

The driver of the pickup takes a little longer. There is not enough room, or the right angle, to employ the jaws easily, but hacksaws work nearly as quickly. In a short time, which seems considerably longer to him, his foot is free, and the EMT's take over. He, too, is soon on his way to the hospital.

Additional radio transmissions reveal that while all this is going on the sheriff and state trooper both arrive, fire police set up road blocks and divert traffic, and two tow trucks are summoned. Even Lt. John Kelson is not aware of all of this, but **if you had been listening to your scanner, you could have followed the whole thing!**



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## Gander Radio:

# Guiding Planes Across the North Atlantic

By David Lewis

### Imagine:

You're racing swiftly through the thin cold air more than six miles above the North Atlantic Ocean, halfway between Europe and North America. The sea below is hard and gray, spotted with clouds closer to the ground than they are to you. The craft you travel in is a modern marvel, a

means of getting from one place to another that would have been impossible, inconceivable, throughout most of humankind's history. And yet this brilliantly designed, built, and piloted air-liner, despite its ability to flout the laws of gravity and the constraints of time, must remain in constant touch

with a highly organized system of similar craft and their safe ports on the surface of the planet. So, as you approach longitude 30 degrees West, you key a switch on the panel beside you and speak into the microphone of your headset:

"Gander, American 6521, position."

"American 6521, Gander, go ahead."

"Gander, American 6521 position 54 North, 30 West at 1850, flight level 390, estimate 52 North, 40 West at 2005, 50 West next. Fuel 92.5. Temperature minus 58, winds 180 at 230, Selcal alpha delta charlie bravo."

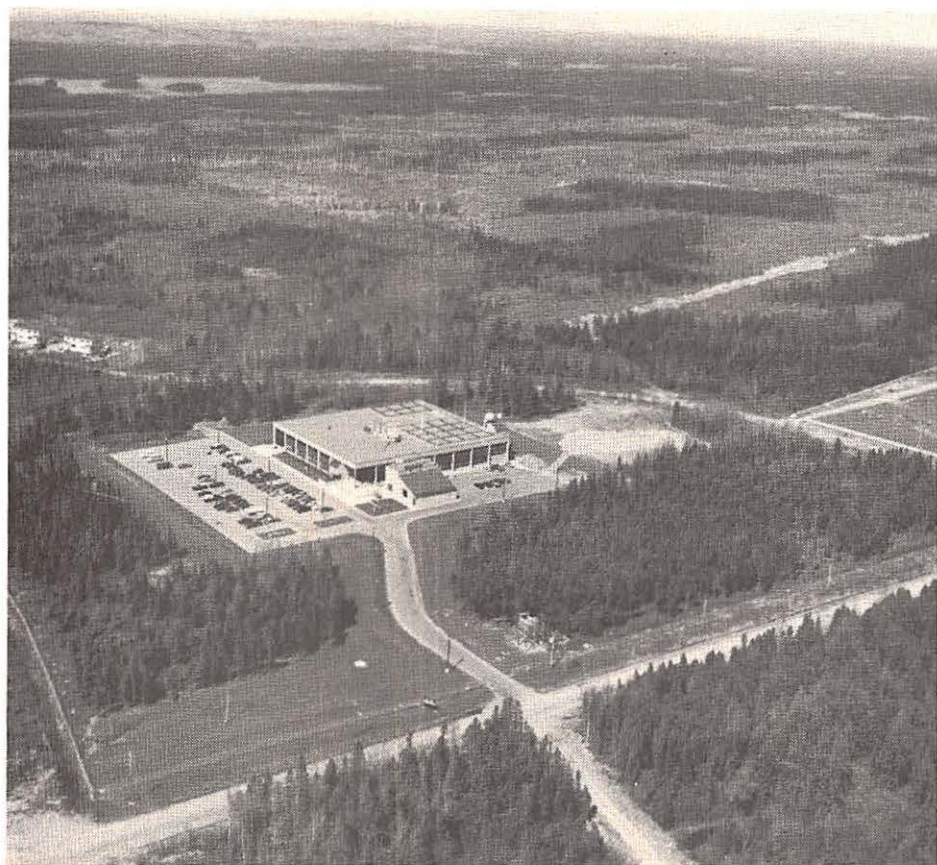
"Roger 6521, confirm" [here is repeated the information given by the pilot, word for word], "report when reaching 40 West. Here alpha delta charlie bravo" [then you hear two tones each lasting a second, that sound like telephone keypad buttons being pressed].

"Gander, 6521, confirm selcal, thank you sir"

"Good day; Gander"

Your ticket to fly along in that cockpit is as close as your shortwave radio. And, just like the flight crew on board the aircraft, you can rely on the professional radio operators at the International Flight Service Station (FSS) at Gander, Newfoundland—or simply, "Gander Radio"—whose constant attention helps guarantee the safety of many thousands of trans-Atlantic air passengers every day.

Gander Radio has been performing this vital service for international air traffic since 1938, using CW (Morse code) until 1948, when voice communications were begun. Since the 1970's, upper sideband has been employed and the frequency plan shown on Table 1 has been in use. It's easy to tune in the two-way HF exchanges between Gander and various aircraft,



C. Falk Foto, Gander, Nfld.

*From the barrens of Newfoundland, land bound operators chart safe courses for planes crossing the gray Atlantic.*





C. Falk Foto, Gander, Nfld.

*With nine operating positions, Gander Radio may be tracking up to 200 aircraft at one time!*

keeping in mind what current propagation conditions may allow from your location when choosing between the 2, 5, 8, 11, or 13 MHz bands. (Some listeners in Northeastern North America may be able to hear the aircraft side of the exchanges on the VHF frequencies shown.)

The duties of Gander Radio, as mandated by the International Civil Aviation Organization, include handling communications between aircraft and Air Traffic Control (ATC), and between aircraft and the companies that own or lease them. Most of the communications we hear are in the first category, that of fulfilling ATC requirements.

An aircraft must report its position every ten degrees of longitude in its travels east to west or vice-versa, and also must request and obtain permission for any course or flight level changes made en route. (Why request changes underway? One reason is that, once aloft, a pilot prefers to cruise in the constantly shifting Jet Stream if heading east—taking advantage of a “tailwind”—and to avoid it, and its “headwind,” if traveling west). These changes must be made in accordance with ATC’s overall plan of keeping track of the position, altitude, and speed of all flights. This information is coordinated between the various ATC centers via a “land-line” teletype network.

There are 62 radio operators, or Flight Service Specialists, employed at Gander and most are Newfoundland natives. Each has undergone a 30 week training course to qualify for this job, which involves continuous, rotating shifts. Gander Area Control Center employs a total work force of about 300, which includes Air Traffic Controllers, technicians, and administrative and clerical staff.

Working as a Specialist is a demanding job. Gander’s responsibility of maintaining communication with all aircraft between 30 degrees West Longitude and “landfall” over North America—an area comprising 1,152,000 square miles—can mean that they are in contact with up to 200 aircraft at a given moment! There are nine air/ground operating positions, each of which may be talking with or following as many as 20 different flights at a time.

The FSS makes an average of 2,000 contacts per day, a peak of 3,000 per day during busy summer months. A typical trans-Atlantic flight talks to Gander four or five times during its crossing, and the information obtained must be relayed with absolute accuracy to ATC. In a year’s time, Gander communicates with about 170,000 aircraft, making almost *one million* contacts.

Listen closely to the radio transmissions between a Gander Specialist and the pilot of the aircraft. Listen for the background sounds, and the tones of voice used: despite the highly disciplined nature of this exchange, there is sometimes a camaraderie, or a mutual professional respect, evident in the brief greetings offered. When the pilot talks, the roar of powerful jet engines can be heard in the background. What listener can honestly say this doesn’t conjure a vivid mental image of the complex instrument panel; of the flight crew members accomplishing their intricate sequence of tasks that add up to successfully transporting hundreds of passengers and tons of cargo safely across the bleak expanse of the North Atlantic?

The responses from Gander Radio bring you the steady, confident voice of the Specialist over

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a faint background of other operators performing the same critical service on other frequencies, as the network extends its thin electronic limbs into an almost limitless sky full of aircraft. This, too, creates a vivid picture in one's imagination.

On one hand, Gander Radio's transmitting set-up can't compare to even a small international broadcaster's. On the other hand, it surely would be the envy of any amateur or "ham" radio operator. Their transmitters are Harris RF727's, running 5 kW each (there are 12 of them) and the transmitting antennas are dipoles. There are 14 receivers—Nardeux NC100's—connected via a multicoupler to a single vertical antenna. The radios and antennas are fed and controlled remotely, and located several miles from the FSS.

Previous *MT* articles explain and define what we hear in these exchanges, but here are a few ideas that may help to understand what is being said. On flight levels, add two zeros: for example, "flight level three-seven-zero" is 37,000 feet. Fuel quantity is given in tons. The "selcal check" is a test of the selective calling system, after which the pilot can put his radio in a squelched mode, and not have to listen to all the traffic on frequency. When the FSS wants to call him, his receiver is activated by his unique tone combination as transmitted by the FSS. The selcal is tested at least once by each flight when establishing initial contact with the FSS. Positions are given in round numbers of longitude and latitude; times in 4-digit UTC.

Quite a variety of aircraft call in to Gander; during a recent half-hour listening session the following company names were logged: TWA, UPS, Air Romania, Delta, US Air, Olympic, American, Lufthansa, Aeroflot, Air France, as well as a few privately owned planes.

Many of us agree that radio is the most interesting medium available for "armchair traveling," and listening to jets winging their way through the upper atmosphere ranks very high for immediacy and excitement. How else are you likely to find yourself along for the ride in an Air France Concorde at "flight level five one zero, speed Mach one decimal two"? (Almost 10 miles high, traveling considerably faster than the speed of sound.) If you want to get some real mileage out of your shortwave receiver, tune in to Gander Radio.

Gander Radio does QSL: send reception reports to Wayne Lorenzen, Transport Canada, Gander International Flight Service Station, P.O. Box 328, Gander, NF, A1V 1W7.

**MT**

*The writer wishes to thank Lily K. Abbass and Fred Snow, of Transport Canada Public Affairs for providing considerable background information for this article.*

**Table 1.**  
**Gander Frequency List**

Gander IFSS has five full-time and four part-time operating positions. The part-time positions are manned during peak traffic periods. Each operating position is assigned specific "VHF" or "HF" frequencies from the following frequencies available at Gander:

<u>HF Family</u>	<u>HF Freq kHz</u>	<u>VHF Freq MHz</u>
A	3016	126.9
	5598	127.1
	8825	127.9
	13306	
B	2899	
	5616	
	8864	
	13291	
C	2872	
	5649	
	8879	
	11336	
D	13306	
	2971	
	4675	
	8891	
E	13291	
	3476	
	6628 "	
	8906	
	11309	

The following network ground stations share some HF frequency families with Gander IFSS:

<u>Station</u>	<u>Location</u>	<u>HF Family</u>
Shannon	Ireland	A, B, C, and D
New York	USA	A, B
Santa Maria	Spain	A, B
Lisbon	Portugal	A
Reykjavik	Iceland	B, C, and D
Iqaluit	Canada	D
Churchill	Canada	D
Cambridge Bay	Canada	D
Bodo	Norway	D

*This table courtesy of Transport Canada Public Affairs*



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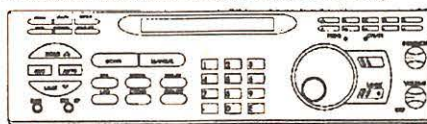
On April 19, 1993, the FCC amended Parts 2 and 15 of its rules to prohibit the manufacture and importation of scanning radios capable of intercepting the 800 MHz cellular telephone service. Supplies of full coverage 800 MHz scanners are in *very* short supply. If you need technical assistance or recommendations to locate a special scanner or solve a communications problem, call the Communications Electronics Inc. technical support hotline for \$2.00 per minute at 1-900-555-SCAN.

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137.000 - 173.995 MHz (NFM), 174.000 - 215.995 MHz (WFM),  
216.000 - 224.995 MHz (NFM), 225.000 - 399.995 MHz (AM)  
400.000 - 511.995 MHz (NFM), 512.000 - 549.995 MHz (WFM)  
760.000 - 823.9875 MHz (NFM), 849.0125 - 868.9875 MHz (NFM)  
894.0125 - 1,300.000 MHz (NFM).

The new Bearcat 8500XLT gives you pure scanning satisfaction with amazing features like Turbo Scan. This lightning-fast technology featuring a triple conversion RF system, enables Uniden's best scanner to scan and search up to 100 channels per second. Because the frequency coverage is so large, a very fast scanning system is essential to keep up with the action. Other features include **VFO Control** - (Variable Frequency Oscillator) which allows you to adjust the large rotary tuner to select the desired frequency or channel. **Counter Display** - Lets you count and record each channel while scanning. **Auto Store** - Automatically stores all active frequencies within the specified bank(s). **Auto Recording** - This feature lets you record channel activity from the scanner onto a tape recorder. You can even get an optional **CTCSS Tone Board** (Continuous Tone Control Squelch System) which allows the squelch to be broken during scanning only when a correct CTCSS tone is received. **20 banks** - Each bank contains 25 channels, useful for storing similar frequencies in order to maintain faster scanning cycles. For maximum scanning enjoyment, order the following optional accessories: PS001 Cigarette lighter power cord for temporary operation from your vehicle's cigarette lighter \$14.95; PS002 DC power cord - enables permanent operation from your vehicle's fuse box \$14.95; MB001 Mobile mounting bracket \$14.95; BC005 CTCSS Tone Board \$54.95; EX711 External speaker with mounting bracket & 10 feet of cable with plug attached \$19.95. The BC8500XLT comes with AC adapter, telescopic antenna, owner's manual and one year limited warranty from Uniden. Order your BC8500XLT from Communications Electronics Inc. today.



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## DXing Shortwave From Central America

By Don Moore

Looking for a DX target area with lots of small stations and interesting cultures? But, one that doesn't take fancy equipment and years of experience to monitor?

Just look "south of the border" to Central America. Because Central America is so close geographically to North America, even low powered stations can put in excellent signals. Unless the VOA or RCI plops down on their frequency, any shortwave station in Central America is likely to make it up here.

Historically, Central America consists of the five countries of Guatemala, El Salvador, Honduras, Nicaragua, and Costa Rica. Under Spanish colonial rule, these countries and the Mexican state of Chiapas formed the Audiencia de Guatemala. Central America declared independence on September 15, 1821, and was promptly annexed by Mexico, then under dictator General Agustín de Iturbide. When Iturbide was overthrown in 1823, Central America was allowed to go its own way, but the northern province of Chiapas decided to remain with Mexico.

For fifteen years Central America attempted to be a unified country, but remained bogged down in civil war due to regional jealousies and

disagreements. The Central American congress finally dissolved in 1838. Although the five countries went their separate ways, they maintain a strong regional cultural identity.

### Guatemala

Culturally, Guatemala is the most interesting country of Central America. While half the population is mestizo (called *ladino* locally), or people of mixed Indian and Spanish ancestry, the other half is full-blooded Mayan Indian, belonging to over two dozens tribes, each with its own language and customs.

Ladinos live in eastern Guatemala and the main cities and towns, and the Mayans live in rural areas and villages in the highlands of central and western Guatemala.

Guatemala has an official government radio station, **TGW, La Voz de Guatemala**. TGW got a good start in 1931 under the rule of General Jorge Ubico, a radio hobbyist. Unfortunately, recent governments have not been so kind with funding. The shortwave outlets on 6180 and

9760 kHz have been sporadic at best for many years and even the aged AM transmitter in Guatemala City is reportedly broken down. Until money is found to reequip TGW, we are unlikely to hear it on SW again.

Most Latin American countries have at least a few commercial stations that supplement AM and FM with shortwave. Not Guatemala—the government outlawed commercial shortwave broadcasting years ago. But, there are plenty of other shortwave targets, as Guatemala has ten religious SW broadcasters, the highest concentration in the world! Two are in Guatemala City: the easy one is **TGNA, Radio Cultural**, which was founded by American Baptists and is well heard in North America on 3300 kHz with Spanish and some

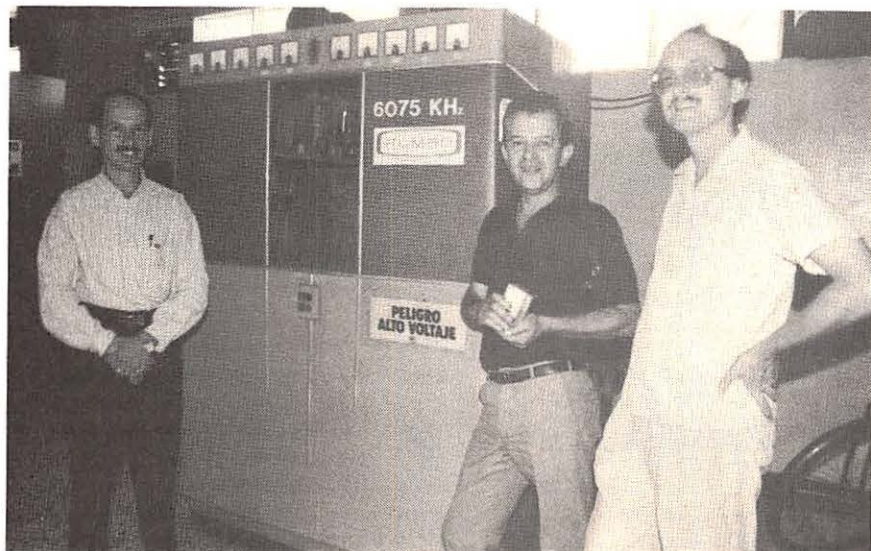


English religious programming (see "Homebrew Radio In Guatemala," *MT* 6/88).

The Adventist Church's **Union Radio** is a bit tougher catch on 5980 kHz. The Adventists are very active in Central America, both in converting souls and in sponsoring some of the region's best hospitals and schools. They had long wanted a radio presence in Central America, when in the late 1970s Guatemalan Adventists volunteered to take on the task.

A small station was started with 10 kW on medium wave and shortwave. Donations from the main Adventist Church made the studio the best equipped in Central America at the time. According to plans, the station was to grow into a major international broadcaster and Adventist World Radio's voice in Latin America.

Unfortunately, someone had not done all their homework. If they had, they would have found out that Guatemalan law prohibits anyone except the government from operating radio transmitters of greater than 10 kW and also prohibits anyone except Guatemalan citizens from serving as radio announcers for programs produced in the country. AWR would not be permitted to bring in the higher power SW transmitters and the foreign announcers necessary for broadcasts in other languages. Union Radio remains a small backwater operation in the AWR network, a shadow of what it had hoped to be.



*If Deutsche Welle ever abandons 6075 kHz, Costa Rican Radio Rumbo would like to put this transmitter back on the air! (The author is pictured on the right.)*



## Provincial Radio

Central America as a whole is rugged and mountainous, but nowhere is it more so than in central and western Guatemala, home of Guatemala's Mayans. Regular AM and FM stations simply won't penetrate the remote valleys and mountainsides where they live.

It wouldn't matter if the signals did, however. Because of strong anti-Indian prejudice by the Ladinos who control Guatemala, neither TGW and almost no commercial stations broadcast in Mayan languages. Instead, missionary stations serve the Mayans, and they use short-wave.

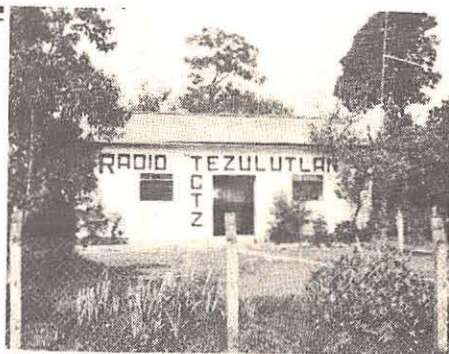
In provincial Guatemala, there are eight shortwave stations: five Roman Catholic and three which are Evangelical Protestant. Actually, the stations do a lot more than preach. Much of their broadcast time is devoted to community, education and health programs.

Marimba music is the most popular type of music. Ranchera and tropical music are also heard, but are not as popular among the Mayans. The latter two types of music are more common on Guatemalan AM stations which broadcast for the Ladinos. Some programming is in Spanish, but most is in Indian languages.

Although the Mayan languages are phonetically very different from Spanish, it is easy to be fooled into thinking they're Spanish. A lot of Spanish words have been borrowed, especially for modern ideas and religious terminology. Usually about the time you start to figure out that you're listening to an Indian language, they throw in a few Spanish saint's names to confuse you!

Guatemala's provincial SW stations are best heard in the morning just after they sign on, mostly around 1100-1200 UTC. As Guatemala is only a short ionospheric hop away from North America, reception can be quite clear and strong sometimes, especially in mid-winter. Also, Guatemalan stations tend to be interference free, as higher powered stations in South America have already faded out with their local sunrise and the Guatemalans are more than a match for any Asians on nearby frequencies.

Let's take a look at Guatemala's provincial SW stations, starting with the Roman Catholic ones. **Radio Chortis**, on 3380 kHz in the eastern town of Jocotan, is sponsored by Belgian and German Catholics who also fund a small trade school. Broadcasts are mainly in Spanish, with a few hours of Chorti each week. Except for the very elderly, all Chortis are bilingual in Spanish and their lan-



*Roman Catholic station Radio Tezulutlan serves the Kekchi Indians of Central Guatemala.*

guage is gradually disappearing.

Not far away, in the town of Coban, **Radio Tezulutlan** ministers to the 250,000 Kekchi Indians of the Alta Verapaz region. On 4835 and 3370, broadcasts are in Spanish and Kekchi.

West of Guatemala City in the Lake Atitlan region is **La Voz de Atitlan** in Santiago Atitlan with broadcasts in Tzuthil and Spanish on 2390 kHz. In North America this is the easiest catch in the difficult 120 meter band, excluding WWV.

Also near the lake is **La Voz de Nahuala** on 3360. Although the manager is a nun from Spokane, Washington, La Voz de Nahuala is primarily operated by Quiche Catholics. At about 800,000, the Quiches are the largest indigenous group in Guatemala. Some programs are also broadcast in Cakchiquel, as well as Spanish.

The last is **Radio Mam** on 4825, which serves the Mam tribe, Guatemala's second largest indigenous group. Radio Mam is not very easy to hear, however; it doesn't sign on until 1300 UTC, too late for reception in much of North America except in mid-winter, and signs off at 2330 UTC, around local sunset. If you can't get it at sign-on, the best bet is to keep an eye on the frequency for occasional late fiesta broadcasts.

For years, the only Evangelical Protestant station in rural Guatemala was **Radio Maya de Barillas** in the remote northwest. Radio Maya broadcast in a number of smaller Maya languages ignored by the Catholic stations, such as Kanjobel and Chuj. It was successful, and operation and ownership of the station was eventually passed from American missionaries to area tribal evangelical churches. Radio Maya is a sure bet on 3325 kHz, and a very difficult catch on 2360 kHz in 120 meters.

In 1987 and 1988, the Evangelical churches went in direct competition with Guatemala's Catholic radio stations for the souls of two of the largest groups. The tiny Mam Evangelical church, long served only by occasional broadcasts on Radio Maya de Barillas, established its own station, **Radio Buenas Nuevas** (Good News) on

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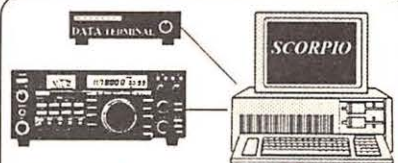
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*The main studio at Costa Rica's Radio Reloj.*

4800 in the small town of San Sebastian Huettenango. American missionaries and the technical staff at TGNA were instrumental in getting the station on the air, but Mam Evangelists initiated it and continue to staff and run the station.

Not long afterwards, in early 1988, **Radio Kekchi**, 4845 kHz, came on the air from the small town of Fray Bartolome de las Casas near Coban. Like Radio Buenas Nuevas, Radio Kekchi was initiated by Kekchi Evangelicals and assisted by TGNA and American missionaries. Although it is primarily run by Kekchis, it maintains an affiliation with a missionary education group headquartered in Mexico. Ironically, the town of Fray Bartolome de las Casas, Radio Kekchi's location, is named after the Catholic priest who originally converted the Kekchi to Roman Catholicism.

### Three Mestizo Countries

In the middle of Central America are El Salvador, Honduras, and Nicaragua, none of which has a significant Indian population. Their populations are mainly mixed mestizo ancestry. Culturally, they are Spanish-American; any vestiges of the original Indian cultures have long disappeared.

El Salvador is just beginning to recover from its long civil war. Before the war it was relatively prosperous, and other Central Americans regard Salvadorans as the most hard-working people in the region. Given time to recover, it should again have a strong economy. Although rich in resources, El Salvador is a tiny densely-populated country. As such, there really isn't much need for domestic shortwave broadcasting.

There are lots of AM and FM stations and the main ones serve the entire country very easily through efficient networks of 1 kW medium wave repeaters. There hasn't been any commercial shortwave broadcasting from El Salvador for decades. Government-owned **Radio Nacional** has sporadically been relayed on the 49 or 31 meterbands, but always for a foreign audience or in an attempt to reach Sal-

vadorans abroad. It hasn't been active recently and North American DXers probably have a better chance at hearing their AM frequency of 655 kHz than one of the highly irregular SW transmissions. Still, a renewal of Radio Nacional on SW might be one way to help improve El Salvador's battered image abroad.

Of course to DXers, El Salvador is remembered as the location of two of the 1980s' most interesting clandestine stations, **Radio Venceremos** and **Radio Farabundo Marti**. Although there was some speculation that the stations might really be broadcasting from Nicaragua, they were visited by enough international journalists to confirm beyond a doubt that the broadcasts came from guerrilla controlled territory.

Today a fragile peace has come to El Salvador and the two former clandestines are now legal FM stations in San Salvador. There have been rumors that one or the other might return to shortwave as there doesn't seem to be much prospect of them getting frequencies in the crowded Salvadoran AM band. Shortwave might be their only hope of again reaching all of El Salvador, not to mention the overseas friends they made with their clandestine broadcasts.

Until either Radio Nacional or one of the former clandestines comes back on SW, DXers are going to have to wait to enter El Salvador in their logbooks again. There are no active stations in El Salvador today.



### Honduras

Like Guatemala, Honduras is easy to hear thanks to religious broadcasters. The most important one is

**HRVC, La Voz Evangelica**, on 4820. It is heard quite well many evenings until 0500 sign-off and in the mornings after 1030 sign-on. Except for an occasional late night taped sermon in English, all programming is in Spanish.

Another Evangelical Protestant station is **Radio Luz y Vida**, 3250 kHz, operating from the remote coffee town of San Luis in western Honduras. The missionaries have a very extensive operation here with a health clinic and their own air strip. Most programming is in Spanish, but reception reports can be sent in English to station manager Don Moore (no relation to the author, although I used to get his mail sometimes as a Peace Corps volunteer in nearby Santa Barbara!).

A third evangelical station is **La Voz de Mosquitia**, 4910, from the remote jungles of eastern Honduras. This station has had an on again/off again history, including a messy



*Faro del Caribe is Costa Rica's oldest and smallest international broadcaster.*

divorce of the American missionary founders. Recently it passed to new management and has become more predictable.

Unlike Guatemala, commercial shortwave is allowed, but there isn't much need for it. While parts of Honduras are beyond the reach of AM/FM stations, the people who live in those regions are poor peasants generally outside the market economy. **La Voz del Junco** on 6075 is the only somewhat active Honduran commercial SW station, but the SW transmitter is mainly a hobby of owner Antonio Hasbun. It's not logged very often, usually being buried under Deutsche Welle.

Several other commercial stations have SW licenses, but only use SW a couple of days every few years — just long enough that the government doesn't take away their licenses. No one knows when they might pop up, but if **Radio Landia** 4965, **Radio Progreso** 4920, or **Radio Lux**, 4890 are on the air, make a log now as they will probably be gone tomorrow!

Finally, there is Jeff White's proposed commercial station, **Radio Copan Internacional**, which should be on the air by the time you read this on 15675, 15105, 9850 and 7375 kHz.

There is one more station in Honduras, **Sani Radio** on 4755 kHz. Neither commercial nor religious, Sani Radio is run by a private development agency and serves some small tribes of Indians in the eastern Honduran jungle.



### Nicaragua

Not long ago, tiny Nicaragua was an easy catch. In the early 1970s the Somoza dictatorship operated **Radio Nacional** with 100 kW on 11820 kHz until the 1973 earthquake took it off the air. In the late 1970s the Sandinista revolution put Nicaragua back on the DX map with clandestine **Radio Sandino**. After coming to power, they pulled the old Somoza transmitter out of storage and used it for an external service in 49 meters, **La Voz de Nicaragua**.

But the Contra war and the U.S. trade embargo gradually brought down Nicaragua's



economy and Sandinista government. One of the first casualties of the declining economy was the external service.

For several years now, shortwave broadcasting from Nicaragua has been sporadic. A new commercial outlet, **Radio RICA**, appeared on 4920 and shut down almost as quickly. **Radio Miskut**, a former clandestine broadcaster, has been heard occasionally on 49 meters, as well as its former out-of-band clandestine frequencies.

Shortwave broadcasting is the only viable means of reaching Nicaragua's sparsely populated Caribbean coast, and regular shortwave broadcasts will certainly return to Nicaragua. But until the economy recovers from the war and trade embargo, it's going to be tough going for Nicaraguan broadcasters.

## Costa Rica

Costa Rica is, well, Costa Rica. It's just different from anywhere else in Central America. When the Spanish came, there were few Indians here and no gold or silver. Instead of rich landowners with slaves and peasants, Costa Rica was settled by Spanish farmers. Unlike the usual Latin American model of a small rich class controlling a large mass of poor peasants, Costa Rica developed into a working class democracy.

Except for two lapses totalling only a few weeks, Costa Rica has had a democratic government for over 100 years. In 1948, the government took the unusual step of disbanding the army, which allowed it to spend more money on development. Today the United Nations ranks Costa Rica as the most developed underdeveloped country and expects it to join the ranks of developed nations by 2000. Literacy is universal and almost all homes have electricity, telephones, and running water.

That is not to say there aren't still pockets of poverty, but they're more like poverty in the U.S. rather than poverty elsewhere in Latin America. In fact, in some basic health categories, Costa Rica ranks equal to or above the U.S.! All these wonderful things combined with liberal shortwave licensing laws have made Costa Rica a center for small scale international broadcasting. The oldest is **TIFC, Faro del Caribe**, which relays its local AM service on SW for a regional audience.

In the late 1980s, after the screwup in Guatemala, **Adventist World Radio** turned to Costa Rica for its Latin American station. Then, of course, there is UN sponsored **Radio For Peace International** with its wide variety of alternative political and environmental programs. Check the *Monitoring Times* Shortwave Guide for the most recent English schedules from these stations.



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More recently, **Radio Exterior de España** opened a relay station here, and part of the agreement allows **Radio Nacional de Costa Rica** to start its own international service via the Spanish transmitters. As this is being written, the service has not yet started.

But, if you really want to hear Costa Rica, you have to go after one of the local broadcasters on shortwave. San Jose's main news station, **Radio Reloj**, has been Costa Rica's main shortwave voice for several decades on the unusual frequencies of 4832 and 6006 kHz. Operated by the three Barahona brothers, this is one of the most professional small stations in Latin America.

Other small Costa Rican stations have been more irregular on shortwave, but **Radio Casino**, 5954, and the national university's **Radio UCR**, 6105, have been heard recently. Another station, **Radio Rumbo**, would like to return to SW if Deutsche Welle's high-powered transmitters would vacate Rumbo's longtime SW frequency of 6075, which DW took over about ten years ago.

## The Other Countries

Historically and culturally, Panama and Belize are not really part of Central America,

even if most outsiders assume they are. But, we will give them a brief mention here. Over a decade ago, **Radio Belize** was often heard in North America, but while the engineering staff built up a network of FM relays around the country they left the shortwave transmitter unmaintained until it no longer functioned. The station no longer uses shortwave and whether or not they will again is anybody's guess (See "Radio Belize: Caribbean Beat in Central America," *MT* 1/89).

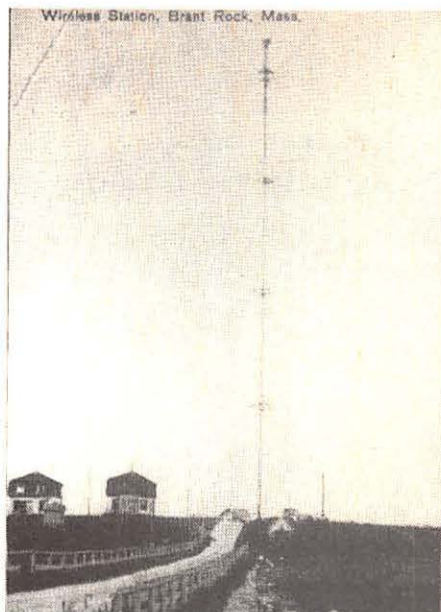
No Panamanian station has used shortwave since the late 1960s, which is surprising considering that there are large rural areas in both eastern and western Panama. Perhaps if more development and population starts to flow into these areas we may see some shortwave from Panama.

A few years ago there were reports that Fidel Castro had shipped a 50kW shortwave transmitter to Manuel Noriega. Unfortunately for DXers, George Bush invaded Panama before Noriega had a chance to get it on the air, if indeed the story was true.

Well, that's our Central American radio tour. What's left? Nothing but going to the shack and starting to tune them in! *Buena sintonia* (good listening), amigos!

MT





# THE GHOST OF REGINALD FESSENDEN

By Everett L. Slosman

**WE** just left Hallowe'en headed in to the Christmas season, so we have for you a Christmas ghost story. As you might guess, it's not your usual seasonal sentimentality. It's a story about voices and music coming from radios that previously carried only dits and dahs: an event that took place 87 Christmas Eves ago.

The principal star of the show was Reginald A. Fessenden (pronounced FESS-end-in), and his audience was made up of United Fruit Company wireless operators standing a cold watch in the Atlantic.

In that broadcast, Fessenden accomplished something few scientists believed possible. His broadcast reached from Massachusetts' South shore to receivers in far away Guantanamo Bay, Cuba. A lone wolf inventor proved audio could be transmitted, and left many experts, including Edison, speechless.

Though Fessenden invented the heterodyne circuit, history awards the laurels to Marconi, DeForest, and Armstrong. The Canadian-born Fessenden originated broadcasting as we know it today, yet Marconi has been dubbed "the

father of radio" by less knowledgeable historians.

Fessenden's erratic behavior and public image may have contributed to this.

Take station location. When wireless seemed like magic to the public, Marconi isolated his operations on Cape Cod, an hour's horseback ride from the nearest town. Only his employees witnessed the inevitable failures.

Fessenden built on Blackman's Point at the edge of Brant Rock, MA, a summer playground for upper middle class families and a favorite fall hunting grounds for sea duck or scooter. Failed experiments were public knowledge.

Brant Rock is part of Marshfield, a community that still boasts a considerable number of gingerbread houses owned by residents with an attitude. Into this puritanical setting came Fessenden, a six-foot- plus, 300 pound bundle of motion sporting a black Inverness Cape. Heads swiveled and horses reared as he double timed down the one main street, his sandy beard unfurled in all directions.

Residents didn't appreciate his 420 foot antenna made from smokestack pipe. Nor did they appreciate that the tower was hollow, enabling workers to climb to the top and gain a spectacular view of their back yards.

During this same time, Fessenden erected a similar structure at Machrihanash, Mull of Kintyre, Scotland, where conservative locals

arched eyebrows and moved their sheep to other pastures.

Born 1866 in East Bolton, Quebec, to an impoverished Anglican minister, he was also the grandson of an indigent inventor. He spent his formative years in genteel poverty (a Victorian euphemism for flat broke).

Blessed with a razor-sharp mind, academic ability, not money, took him to Bishop's College, Lennoxville. Here he taught math, French, and Greek by day and studied for a degree at night.

However, before graduating, Fessenden took a teaching job in Bermuda where he met and fell madly in love with Helen Trott, a wealthy planter's daughter.

He moved on to New York City pursuing his fortune, and with hard work, good luck, and lot of chutzpah landed a job at Edison Laboratories. Here, he accomplished two things: gained a reputation for non-conventional thinking and married Helen. Shortly after the wedding, Edison's company went bankrupt.

Over the years, a pattern emerged. Fessenden pioneered a concept; others capitalized on it. Twice, Andrew Carnegie, the steel baron, offered Fessenden a partnership and twice Fessenden turned the aging industrialist down.

Eventually, Pittsburgh University made Fessenden a professor of electrical engineering, a job he quit to build an experimental Weather Bureau station at Cobbs Island, VA.

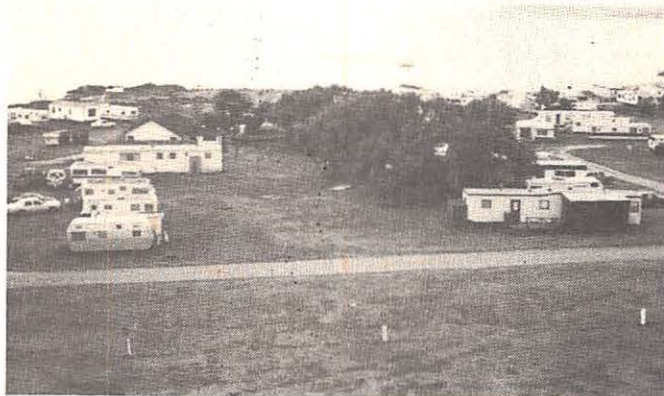
By 1900, Fessenden's audio transmission experiments shifted into high gear and he almost beat Marconi to the first trans-Atlantic transmission. That December, he transmitted an audio signal between two 50-foot towers spaced a mile apart.

After patenting the heterodyne circuit in 1905, Fessenden joined two Pittsburgh millionaires, Thomas Given and Hay Walker, Jr., in forming the National Electric Signaling Company.

Construction began on both Brant Rock and Machrihanash. When they were finished, he built a small test station in Plymouth, Massachusetts, 11 miles away.

A year later, an assistant in Scotland telegraphed, "At four o'clock in the morning, I was listening for telegraphic signals from Brant Rock when to my astonishment, I heard the voice of

*Aerial view of the station site as it looks today. The tower is in the green patch of woods. Photo taken from Blackman's ham tower. Above: Reproduction of an old post card. The two houses on the left still stand.*







*Blackman examining the base of Fessenden's tower. The swivel enabled the tower to move with the wind, keeping the weather strains from snapping the guy wires.*

Mr. Stein telling the operators at Plymouth how to run the dynamos." Fessenden was ecstatic.

However, before National Electric Signaling could hold a public demonstration, Mac-hrihanash's tower went down in a storm. Never one to let a little adversity spoil his mood, Fessenden sent messages to all the United Fruit ships at sea and told them to listen around midnight Christmas Eve.

Inadvertently, Marconi Wireless America had set the stage for a captive audience. They had a firm policy against handling traffic from vessels not equipped with Marconi's radios. United Fruit Company's vessels used Fessenden's receivers. So, shipboard operators were primed for National Electric transmissions. Ironically, 14 years later United Fruit became a key player in the RCA consortium that bought out Marconi's American wireless interests.

Fessenden opened the program by telling listeners what they would hear. Handel's "Largo," became the first record ever aired and the Edison windup phonograph that played it became the first studio turntable.

Live talent took over as Fessenden played Gounod's "Oh Holy Night" on his violin and even sang the last verse when the singer got "mike fright."

Luke's traditional Bible reading, "Glory to God in the highest and peace on earth to men of goodwill," followed. Finally, Fessenden wished the audience a Merry Christmas and promised another broadcast New Years Eve.

That sub-zero windy midnight, wireless moved from Marconi's singular point-to-point transmissions into Radio: the mass communications medium.

Though the broadcast drew raves, a series of torts and lawsuits hassled Fessenden in an endless stream of litigation. For the next two decades, the professor spend more time in court than in the laboratory.

Fessenden left National in 1911. Three years later, the station closed and was dismantled.

## The Tradition Continues

When Dana Blackman, a computer numerical control machinist and ham radio operator (N1EWA), used a family souvenir for his QSL card, he didn't give Fessenden's activities much thought. After all, Dana grew up on stories about the stogie-smoking genius who once leased the family's property for the National Electric Signaling Company.

It wasn't until Dana installed his own 85 foot ham tower that he realized Fessenden represented more than another family story taken from a history dating back to Pilgrims at Plymouth Rock.

A friend, Dave Reilly (AA1A)—considered the "Fessenden Authority in these parts"—set up a special events station at Blackman's Point several years ago and invited the non-hamming Dana to sit in. That started a love affair with hamming.

Dana had no trouble with code; "I learned it in the Boy Scouts and it just went from there." Anxious to get on two meters, he took the technician's test directly.

Now, he hangs out there on his way to work and during at-home evenings. Some Saturdays, he enjoys joining other two meter buffs for an informal breakfast at Marshfield's Masonic Temple. This adds an enjoyable face-to-voice dimension.



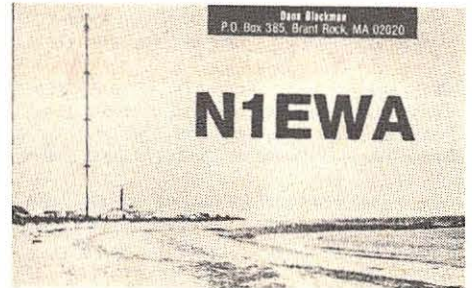
*Dana Blackman at the controls of N1EWA.*

Blackman's Point returned to a quiet resort and Brant Rock resumed its uneventful existence.

Only the tower base and a concrete anchor mark the site. MTV-bred children romp on these artifacts oblivious to the history behind the crumbling structure.

Two of the Point's three remaining homes once served as headquarters for National Electric Signaling, and several members of the Blackman family still live there. One is an amateur radio operator (see sidebar).

During Fessenden's lifetime, he produced over 500 inventions including a radio compass, fathometer, underwater signaling system, sub-



*Dana Blackman's QSL taken from an old post card showing Fessenden's station.*

marine detector, turbo-electric battleship drive, an anti-aircraft tracking device, and an acoustical system for musical instruments.

Fessenden's scientific accomplishments were acknowledged by the Radio Engineers Medal of Honor and a John Scott Medal for pioneering in radio. For contributions to marine safety, he received the Scientific American Medal.

Fessenden died in Bermuda in 1932.

And now, the "ghost" part of the story. A commercial radio station, WATD-FM, operates from facilities approximately five miles from Blackman's Point on 95.9 MHz. On Christmas Eve, they move a mobile unit to Blackman's

His shack, a room on the second floor, houses an ICOM 751A world band rig, a 2 meter Kenwood all-mode, and a lot of peripheral equipment. "I go to flea markets and bump into something I just can't do without." Yet, the room is surprisingly neat.

Dana often visits the Christmas Eve broadcast. "I watch 'em do their thing, play the violin, sing songs, and drink some refreshment. A couple of times the wind's really been blowing and it got kinda chilly down there."

When he drops to 40 or 80 meters, Dana enjoys CW and will occasionally CQ. However, he is not a DXer or contest buff; preferring friendly conversation.

Dana supports special events stations like the one run by Whitey (K1VV) on Fessenden's birthday and there is talk among the two meter crowd about a 90th anniversary station from three years from now.

If you're looking for a contact, patience and some luck may catch Dana away from his activities; working out at the health club, riding a bicycle for exercise, fishing, and remodeling his hundred-plus year old house.

Yet, Dana wants to raise his code speed to 13 wpm. His special nemesis? The word 'antenna' in code. Give you any ideas?





# 'Tis the Season to go Scanning

by Allen Cole, N4JRI

Twas the month before Christmas, and all through the town,  
Yours Truly had the mall freqs and tones all nailed down.  
Leaving them no escape—except frequency hopping,  
I felt peaceful and in the right mood to go "shopping."

Now about that completeness, I'll make this confession.  
My nailed-down-tight town left a single obsession.  
One mall had slipped by, and it was my fervent wish,  
To nail down this varmint that got past the fence.

I was frisked before leaving, by my wife (what a doubter)  
Who proceeded to impound my frequency counter.  
She cut me off short as I started to whine ...  
"You've done enough scanning; we're shopping this time!"

I pouted and sulked as my wife drove the car.  
I thrive being henpecked, but this goes too far!  
With my counter and notebook left so far behind,  
I felt as if naked—and losing my mind.

Then all of a sudden I felt in my pocket ...  
My trusted old friend! (I went off like a rocket)  
When the wife blithely put my toys back on the shelf,  
She'd forgotten to check for the scanner itself!

I walked in the mall feeling rapture untold,  
But reality hit, and my blood just ran cold.  
I had my companion, and could fire it up soon,  
But what good's a scanner—knowing not where to tune?

I took a wild guess, one-five-four point six-oh.  
They love it in Jobcomms—the green dot, y'know.  
Then I cranked up the volume, a major mistake,  
And a loud voice boomed out, "Want some fries with that shake?"

The world became blurry and time seemed to stop.  
The crowd was just staring. You could hear a pin drop.  
I smiled rather weakly and felt like a freak,  
Who needed an earphone and better technique.

I ran to the bookstore and hid in the stacks,  
where a voice said, "Your methods have gotten too lax."  
"These books, fiche, and counters have softened your brain."  
"Try the scanner's instructions." (still in cellophane).

"The scriptures are ancient, but their wisdom applies,  
"When you're trying to catch these security guys."  
"The manual states (like a strict moral code)  
"When you don't know the channel, you use the 'search' mode."

The SEARCH MODE! Now who'd ever heard such a thing?  
It did make good sense, though, and had a nice ring.  
I stalked out the door with a spring in my walking,  
(As the clerk came to ask, to just whom was I talking?)

I went straight to work with my Bearcat unholstered.  
The guard had no chance with my confidence bolstered.  
I'd check his antenna and find out which band,  
I should search through to give me the uppermost hand.

I hoped it was VHF-high because, heck,  
I'd leave me a mere sixteen channels to check.<sup>1</sup>  
There would've been more had it been a small town,  
Where they use taxi channels 'cause there's no cabs around.<sup>2</sup>

Or maybe a Radius; I'd like that a lot.  
I'd fake a quick seizure, looking up for the dot.<sup>3</sup>  
But the brick on the belt of this man, old and chubby,  
Was an HT-440 with a UHF stubbie.

A UHF search can be one for the annals,  
But a five-watt HT could mean no two-watt channels.<sup>4</sup>  
I hoped against hope that there'd be a repeater,  
'Cause skipping the 'mobile side'<sup>5</sup> makes things much neater.

I tried the itinerants,<sup>6</sup> they're good for the soul,  
And all of the ones marked for "local control."<sup>7</sup>  
I followed the guard (at a distance discreet),  
He talked. I heard nothing. Oh, bitter defeat.

But then I remembered the bookstore advice,  
And punched up the search mode without thinking twice.  
The squelch opened just above four sixty-one,  
"There's some creep with a scanner, better pull out your gun."

Just then someone grabbed me! (My wife heard the call)  
And angrily dragged me right out of the mall.  
The guard walked behind us, keying up on his mic.  
And the clicking he heard just confirmed my good strike.

Some years have gone by, but they won't forget me.  
The mall's on a trunk now, and has DVP,  
And I've had much less grief from my wife's prudish manner.  
We divorced just last year—and she got the scanner.

NOTE 1: 151.625-151.955 (30 kHz steps), 154.515, 154.54, 154.57, 154.60

NOTE 2: 152.30-152.42, 157.56-157.68 (15 kHz steps)  
Available to Business Radio Service outside Standard Metropolitan Statistical Areas (SMAS) of 50,000 or more.

NOTE 3: Jobcomm/Radius color code: 151.625 (red), 154.57 (blue), 154.60 (green), 462.575 (white), 462.625 (black), 462.675 (orange), 464.50 (brown), 464.550 (yellow)

NOTE 4: 457.525-457.600, 467.750-467.925, and various 12.5 kHz "splinter" frequencies

NOTE 5: UHF "Mobile only" freqs (normally used as repeater inputs) can also be used simplex: 460.650-467.000

NOTE 6: 35.04, 151.625, 464.500, 464.550, 469.500, 469.500, (853.4875?)

NOTE 7: "Local control" frequencies are generally used at a particular location (as opposed to citywide)  
464 & 469.325, .375, .425, .475, .525, .575, .675, .775, .825, .875, .925, & .975

\*Reprinted with permission from Northeast Scanning News, P.O. Box 62, Gibbstown, NJ 08027.

Point, where, in foreshortened New England daylight, they power up to recreate the original broadcast.

Edward Perry Jr., WATD-FM's founder and president, describes himself as "genetically inclined toward broadcasting," which may explain why someone who never heard of Fessenden before coming to Marshfield is now the scientist's most vocal advocate.

Only a true Fessenden soul-mate would brave ice-cube laden winds to sing "O Holy Night" accompanied by a talented, shivering violinist playing with verve and frostbitten fingers.

DXing a Class A FM in December isn't easy. Yet, FM buffs claim some surprising winter catches. To make things a little easier, their sister station, Yarmouth's WATB-FM (103.9 MHz) will simulcast the recreation. Broadcast time will be sometime mid-afternoon EST.

This year, Perry may add a remote from the old WCC receiver site in Chatham or Marconi's original location in South Wellfleet. However, plans were not completed when this article was written. Look for last minute updates on the Grove BBS message section.

Now, for the part that pleases DXers. Perry will QSL reception reports. Listeners who write in support of preserving Fessenden's accomplishments will also receive a special QSL. Letters and reports should be sent to Reginald Fessenden, WATD-FM, 130 Enterprise Drive, Marshfield, MA 02050.

If you're spending Christmas Eve near Brant Rock, WATD-FM can always use another singer willing to brave frostbite. That will please the ghost of Reginald Fessenden very much.

MT





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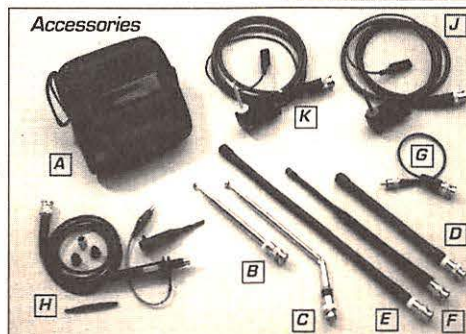
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A CC-90	Case for all models	12.
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C TA-90-L	Telescope elbow antenna	16.
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# Shortwave Broadcasting

**Glenn Hauser**

P.O. Box 81874

Albuquerque, NM 87198

Ph. 505-266-9012

**ANGOLA** UNITA's Voice of Resistance of the Black Cockerel at 0600 on 9710 ex-9700, 1200 on 11837 ex-11830 (BBC Monitoring) Still \*0440 on 9710?

**AUSTRALIA** R. Australia programs: *Feedback*, listeners' questions by fax, phone or mail, Sat. 2210, Sun. 0010, 0210, 0410, 0810. *By Your Request*—music, Sat. 2330, Sun. 0330, 0530, 0730 (Bruce MacGibbon, R. Japan Media Roundup) *Indian Pacific*, Fri. 2230, Sat. 0230, 0430, 0630. *Background Report*, Sat. 1030 and 2-hourly to 2030. *Correspondents' Report*, Sat. 2230, Sun. 0230, 0430, 0630. *The National Country Hour*, resource news from ABC domestic, Mon.-Fri. 0910-0950 (BBCM) Perhaps resulting from antenna changes, 9580 weaker and interfered in our mornings, still in use 0800-2100; try these instead: 5995 at same time; 6020 at 0600-0900, 1100-1230; 6060 at 1430-1600, 1630-2100; 6080 at 1100-1230, 1430-1600; 7240 at 0800-0900, 1100-2100; 7260 at 1430-2100; 9510 at 0900-1000, 1100-1200, 1430-1800; 9710 at 0800-0900, 1100-1230; 11680 at 1430-1800; 11695 at 1600-2100; 11720 at 0030-0900; 11800 at 1300-1600; 13605 at 0900-1000, 1100-1200; 21740 and 17795 at 2130-2400, 0030-0600 (via World DX Club Contact) Two new Thomson-CSF 250 kW transmitters being installed at Cox Peninsula, and enlarging antenna matrix, to test by mid-Oct., but delayed by ship damaging power cable from Darwin (R. Netherlands Media Network)

AAFR, updating sked in Oct. *MT*, p. 22—to Somalia, Mon. & Fri. 1600 only on 10848.5; to Cambodia, daily 0300 on 20418.5, 0900 on 15633.5, 1200 on 9193.5, all USB (Mike Bird and Dave Onley, *OzDX*)

**AUSTRIA** RAI W-93 schedule shows more frequency-hours in English to Latin America than to North America! To us at 1230 on 13730, 0130 on 9655, 0530 and 0630 via Canada 6015; to them at 2330, 0130 and 0330 on 9870 and 13730 (via Thurman, Lytle, Fahrer)

**AZERBAIJAN** R. Dada Gorgud, V. of Azerbaijan, English at \*1700-1757\* on 15240, VOA again with English news on same at 1900-1917 (Brian Alexander, PA) Latter is from domestic service program 2 (BBCM) Both may be one hour later now

**BANGLADESH** Dhaka external in English 1230-1300 heard on 13614v, not announced 13620 or 11705; home service on 15520 1150-1730 includes English news 1255-1300, 1530-1545, 1705-1710, also on 4879 for first two (Sarath Weerakoon, Shri Lanka, UADX)

**BELGIUM** RVI at 1400-1425 exc. Sun. 1330-1355 on 17555 to N. America (via Diane Mauer, Steven Cline, Wolfgang Büschel)

**BOLIVIA** R. Illimani, 6025 announces that UT Mons. 0200-0300 it has family-contact program from studios of WADO, New York (Emilio Pedro Povrzenic, Argentina, *LA-DX*) 1280 kHz

**BOSNIA-HERCEGOVINA** R. Bosnia-Herzegovina, Sarajevo, 24 hours on 6220-USB in Serbo-Croat [sic], and English news varying around 2127, 0000 (BBCM)

**BRAZIL** R. Baré reactivated on 4895 after long silence, fair around 1000 (Don Moore, IA)

**BULGARIA** R. Bulgaria, English until March: 0500-0630 on 9700, 11720; 1130-1300 on 11645, 13645; 1515-1645 on 13670; 1830-2000 on 9700, 7355; 2100-2200 on 9700, 6085; 2245-2400 and 0100-0200 on 9700, 7355 (Bob Thomas, CT) 13670 puts spurs on 13632.6 and 13707.4 (Wolfgang Büschel, Germany) 7355 conflicted with WRNO after 2300 so agreed to move to 7455; RTTY there may cause further shift (George Jacobs via George Thurman)

**CANADA** Supposedly shifting with DST for listener convenience, RCI moved USA services one UT hour later Sept. 26 when Europe went off DST rather than Oct. 31 when we do! The hour now at 0300 gets two bad frequencies, 9725 versus RAI, and 6010 vs. Cuba

All times UTC; all frequencies kHz.

\*asterisk before/after time signifies station sign-on/sign-off;

// means parallel; + means continuing but not monitored;

= 2 x indicates 2nd harmonic of following frequency.

and Mexico!—but gains 9755 Oct. 31 when the Monte Carlo relay shifts to 0400; the 0300 includes UT Mons. the only airing of *Quirks and Quarks*; the *Mailbag* shifted from 0128 to 0228 UT Mons. without warning, now on 11845, 11725, 9755, 9535, 6120. Weekday mornings already at 1300 instead of 1200, losing 9635, still on 17820, 11855, latter mixed with China, AWR; *Sunday Morning* at 1400-1700 on 17820, 11955. Multi-target hour now at 2130 on 17820, 15325, 15140, 13690, 13650, 11945, and via Britain 7260, 5995. Some relays via Sackville changing Oct. 31; R. Japan 0400-0600 on new 6025; CRI 0500-0600 on 11840; R. Korea 1130-1200 on 9650; R. Japan 1300-1500 on new 11705 (via Bill Westenhaver, PQ)

**COLOMBIA** Rdif. Nacional, nice old music around 2100-2300 on reactivated 9655 (Des Preston, MI) Has interference later from Austria (gh) And from Norway at 2250. La Voz del Guainía, Puerto Infrida on 3501.3 at 1100 but giving 630 kHz only, messages. On 6083v at 1700 is Una Voz en la Frontera, Puerto Santander, 4 x 1520 (Santiago San Gil, Venezuela) Don't confuse with Ondas del Darién if active on 6085 (gh) Unlisted 1520 station, Sonoradio in Viterbo, Caldas, heard on 4562v = 3x, 2100-2200; pirate announcing 1620, Armonías de Risaralda, Caldas around 2200 on 4852v = 3x and 6457v = 4x (Henrik Klemetz, Bogotá, *Play-DX*)

**COSTA RICA** AWR Cahuita has had transmitter problems—low output, harmonics, off-frequency. Four are to be shipped back to manufacturers, ELCOR in San José, for modifications, two at a time, first 5030 and 6150, then 9722.5 and 13750 (Adrian Peterson, IN) Also TVI complaints led to curtailed schedule, 0500-1500 though most running half of rated power (Tony Magon, NSW, *World of Radio*) But heard with English at new time, approx. 1500-1700 on 11869.8 and 13749.9 (Brian Alexander, PA)

R. for Peace International's 30 kW transmitter should be in use now on AM, probably 7385 after 0000, 15030 or an additional 19-meter channel in daytime. A quad antenna is used for 15030, sometimes USB, sometimes AM especially for Haiti. Huge new log periodic rotatable antenna can cover 7 to 26 MHz, and new frequencies may appear on 9, 11 or 17 MHz. New photo QSL card is being prepared. More demand for program time may lead to different frequencies not in parallel. *Outlaw for Peace*, Willie Nelson is back with 25 new shows. 21465-USB has been on 24 hours, 7375-USB at night (RFPI Mailbags)

Faro del Caribe, 5055, heard on spur 5035.9 and other 20 kHz increments (Dave Valko, PA, *Fine Tuning*)

**CROATIA** Croatian Radio, Zagreb, on new 13640, best here in daytime, new 100 kW; also gives 5920 but not heard (Michael Oreskovic, Ont.) Actually 13639.8 and 5919.9, not heard on 9830 (Brian Alexander, PA, *W.O.R.*) All believed 24 hours, domestic service (BBCM)

**CUBA** RHC has second fax number, 537-73518 (Arnie Coro, *DXers Unlimited*)

**CZECHIA** CTK news agency reported that government was accepting bids for a private entity to operate a foreign broadcasting service; no mention of existing R. Prague. R. Free Europe may move from Munich to Prague, welcomed by Czech foreign ministry. Slovakia complains that RFE is partial to Czechia (BBCM)

**DOMINICAN REPUBLIC** R. Quisqueya, 6205.47, not daily in 2320-0007\* period includes English announcements as Quisqueya Radio, heard at 2320, 2340, 0003 (Brian Alexander, PA)

**ECUADOR** HCJB has new science/technology program in English, *El Mundo Futuro*, UT Weds. 0100, 0300, 0530, including computer corner moved from *Ham Radio Today*, UT Thurs. (John Beck, *DX Partyline*) Perhaps HCJB will improve science credibility in *Futuro*



show (gh) McVicar expected Oct. 9 (DXPL Oct. 2)

Until Dec. 1, HCJB schedules TWR programs: 0730-0930 Port. 6125, 9515, 11885; 2330-2400 15250, 17490 (Bob Padula, Australia) New station: R. Oriental, 4779.7 from \*0956 to 1044 from Tena, listed on 1360. R. Baha'i reactivated 4950, 0937 Indian language, real back-country folk music (Don Moore, IA)

**EGYPT** R. Cairo on 15210.4 2120-2158\*, strong, distorted, not daily, don't confuse with Iraq (Brian Alexander, PA) [non] V. of the Egypt of Arabism [Arabic: *Sawt Misr al-Urubah*], previously integral part of Iraq domestic service, now heard at 1000-1030 on 11875 or alternate 11815 (BBCM)

**ESTONIA** Contrary to last month, all foreign language broadcasts on 5925 dropped (BBCM)

**FINLAND** YLE now Mon.-Sat. 1230-1300 on 15400, 11735; 1330 and 1430, and Sun. 1430 on 15400, 17740 (1-800-221-9539) No mention of evening broadcast, dropped? (Joe Hanlon, PA)

**GERMANY** DW for Oct., perhaps Nov. onward: 0100 on 6040, 6085, 6120, 6145, 9565, 9700, 9745; 0300 on 6045, 6085, 6120, 9535, 9545, 9640; 0500 on 5960, 6045, 6120, 9670 (Bob Thomas, CT) 9745 via Portugal, despite HCJB perpetual presence there, what a mess-up!

**GREECE** Since Sept. 26, VOG continues 0000-0350 on 9380, 9420, 11645 with news in English at 0130, 0340, but two morning broadcasts to N. Am. consolidated into one at 1300-1450 on 15630, 17515, English at 1435, and Swedish moved into European service at 1940 on 7450, 9380, which can also be heard here with English at 1900 (John Babbis, MD)

**GUAM** New KSDA programs: *Pacific Island Journal*—news and culture—Sat. 1600 on new 7455, 1700 on 13720, 2300 on 15610 (WWCR overlap), UT Sun. 0230 on 13720; *AWR Mailbox*, UT Sat. 0200, 1630, 2330, Sun. 1830 on 13720. *DX Asiawaves* continues Sat. 1615, 2315, Sun. 0215, 1615, 1815. Third 100 kW transmitter should be on by mid-1994, expand from 235 to 273 hours per week, and automate (*AWR-Asiawaves*, via Bill Westenhaver)

**HAWAII** KWHR target is mid-Nov. to mid-Dec., after delays in roofing, wiring. One transmitter, two antennas: TCI curtain at 270 degrees, slewable +/- 15 and 30, covering 9-18 MHz, 22.5 dBi gain; and log-periodic fixed toward Australia/New Zealand. Will have own QSL card but report via Box 12, South Bend, IN 46624 (Joe Hill, WHRI)

**INDIA** AIR testing new "superpower" from Bangalore on 15190, 0800-0845\* (BBCM)

**IRAN** [non] V. of the Mojahed should be one hour later now, 1500-2000 and 0300-0700, and add more possible variable frequencies to last month's list: 5090, 4700, 4670, 3780, 3557 (BBCM)

**ISRAEL** To escape WEWN 7465, Israel Radio moved to 11605/11603 at 0500, //9435 (Daniel Rosenzweig, NY, Fidonet *SW Echo* via George Thurman)

**ITALY** RAI relays domestic Radio Uno or Radio Due to Somalia on 21775 //7175 around 0700-1343\* or one hour later (Giovanni Serra, Rome) RAI token English to N. Am. 0100-0120 on 6005, 9725, 11800 (Bill Westenhaver, Bob Thomas)

**KOREA NORTH** R. Pyongyang service for Korea S., 2100-2030 on 6400, 6250 (BBCM)

**KURDISTAN** V. of the People of Kurdistan main program 1600-1800 apx. on 4095v; experimental at 1500-1625\* on 4130 including R. Kurdistan programs; announces 2nd program at 1400-1600 on 7265, untraced (BBCM)

**LIBERIA** ELWA resumed SW Aug. 9 on 4760 //FM 94.5; 10 kW SW transmitter runs at 3.3 kW because of broken and missing parts (Cordell "Cork" Loken, engineer, ELWA, Box 10-0192, 1000 Monrovia 10, via Tom Robertson, MS, *W.O.R.*) Heard 0638-0700+, religion in English (Robertson)

**LITHUANIA** [non] In Sept. on 7335 vs. CHU, R. Vilnius moved to 7150, English Mon.-Fri. 2300-2330 (Bob Thomas, CT) Should be at 2400-2430 winter time.

**MYANMAR** R. Myanmar, English news at 1515 ex-1445 on

5990, still full of military junta propaganda; now at 1445 are pro-SLORC editorials during 1430-1600 broadcast. Minority service on 4725 added 7185, sounds like 50 kW at least, from 0930; Miyawadi still on 5973 at 1100-1330, 1430-1530 all in Burmese, pop music for troops (Victor Goonetilleke and Sarath Weerakoon, Shri Lanka, UADX)

**NETHERLANDS** RN is trying Madagascar relay for N. America at 0030-0125 on 11655; Bonaire compatible SSB on 9840 ex-11835; also on 6165, and Flevo 6020; at 2330 on 6165, 6020; 0330 on 9590, 6165, both Bonaire (B). Madagascar (M) 11655 continues at 0130, 0230 but to S. Asia. In N. Am. also try: 0730 on 9720-B, 9630-B; 0830 on 9720-B; 0930 on 9865-B, 9720-B; 1330 on 15530-M, 13700-F, 9895-M; 1430 on 15150-M, 13700-F, 9895-M; 1530 on same; 1730 on 21590-B, 21515-B; 1830 on same; 1930 on 21590-B, 17605-B. *No Boundaries*, on development, Tue. 0150, 0850, 1050, 1350, 1550, 1750, 1950, 2350. *Let's Get to Business*, Mon. 0850, 1050, 1450, 1850, 2350. *Mirror Images* during Nov. features the second Minority Language Music Festival, Tue. 0750, 0950, 1450, 1850, Wed. 0050, 0250, 0350. *Dancing Through Colombia* encores Nov. 10-17-24 on Weds., then *Marks on Mechanics* in Dec., 0150, 0850, 1050, 1250, 1450, 1850, 2350. *Sounds Interesting* has gastronomic series first Sats.—Nov. 6, wines and spirits; Dec. 4, fish, fowl, meat and vegetarian entrées, at 0750, 0950, 1350, 1550, 1850, Sun. 0050, 0350. *The Great Sports Experiment*, Fri. 1750, 1950, Sat. 0250, 0850, 1050, 1450, 2350. Documentaries: Nov. 3 and 10, on Israel, Palestine; Nov. 17, Prohibition Politics—narcotics; Nov. 24, Dreamtime in Europe—Aboriginal art; Dec. 1, Dutch roots in Brooklyn—Wed. 0750, 0950, 1350, 1550, 1750, 1950, Thu. 0050, 0250, 0350, Fri. 0850, 1050, 1450, 2350, Sat. 0150 (RN)

**NEW ZEALAND** RNZI is in financial strife; Manager not replaced and now Head of News also resigned; my contract is on a month by month basis. Nine staff keep the station moving. Ministry of Foreign Relations and Trade insist they are only interested in the Pacific for RNZI (Tony King, RNZI via Gigi Lytle) RNZI sports channel 9510 in 1210-1650 period very active now for UK tours—rugby until Nov. 6, All-Blacks Nov. 7-Dec. 4 (RNZI *Mailbox*) Despite Australia also 9510.

**NORWAY** UKE-Senderen, Trondheim, will be on from Oct. 22 to Nov. 14, 0700-0500 daily on 7245 (USENET via Don Moore) R. Norway International, English to us, Suns. and UT Mons. only—2000 on 9590, 2300 on 6120, 0000 on 9675, 11925, 0200 on 6120, 0300 on 6115 (Bob Thomas, CT; Andreas Volk, USENET via Thurman) 6120 a disaster at 0200 with RCI there (gh) During Olympics Feb. 12-27, adds 5-min. weekday report in English at :25 past same hours (Hanlon, PA)

**PALESTINE** Palestinians will launch radio and TV within four months of implementation of self-rule in Gaza, Jericho (*Al-Ra'y*, Amman, via BBCM)

**PHILIPPINES** FEBC Sept.-Dec. English 0000-0130 (Mon.-Fri. 0200) on 15450; 0930-1100 on 11690, 1300-1600 on 11995; *DX Report* Sun. 0940, 1440, Wed. 1325; *DX Dial* Sat. 0940, 1440 (via Larry Russell, MI)

**QATAR** QBS sent sked till 23 Oct. 0245-0705 on 11785, 0800-1305 on 17825, 1305-2130 on 11785. Phone on-air English studio on FM, 894422; hear Arabic service on phone, 222000; fax 894202 or

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864013; gives two P.O. Boxes in Doha, 1414 and 3939 (Mike Hardester)

**RUSSIA** During crises in Moscow, monitor 4055, strategic 60 kW transmitter in center of city made up of 12 old 5 kW jammers (Olle Alm, Sweden, RN *Media Network*) R. Stantsiya Tsentra should now be at 0630-0700 on 12010, 1630-1700 on 9880, mainly religious (BBCM) Tatarstan plans to add SW since 75% of Tatars are abroad (V. of Russia *DX Klub* via BBCM) Rukhi Meroc [sic], Spiritual Heritage in Tatar/Arabic is on Fri. at 1600-1700 on 17890, 12075, 11630, 7160, 4055 (BBCM) R. Hyvong, for Vietnam on 11835 ex-11845, 1400-1500 only in Vietnamese (Tetsuya Kondo, ABI, R. Japan *Media Roundup*) DW relays for winter-93, I-Irkutsk, N-Novosibirsk, S=Samara/Zhigul'yovsk. N-7340 1000-1400 and 2200-2400, S-7315 1400-1800, I-7380 1100-1150, N-7390 1200-1320, N-12045 2230-2320, N-7305 1430-1650, S-12045 0300-0350, S-17675 0800-0850, S-15525 1000-1050; only English is at 1600 (via Wolfgang Büschel)

**RWANDA** RRR on new 15340 2000-2101\* including French ID at closing (Bill Westenhaver, PQ, *W.O.R.*) Is ex-3330 transmitter, not DW's (RNMM) Also new 9610 at 0300-1800, 15340 from 1800, different languages than on 6055 (BBCM)

**SAIPAN** Monitoradio curtailed sked: KHBI-1, 0900 on 17555, 1000 13625, 1200 and 1300 13625, 1400 and 1500 9530, 1800 and 1900 9355, 2200 and 2300 13625; planned changes from Nov. 9: 1000, 2200 and 2300 on 9430. KHBI-2, 0800 and 0900 on 13615, 1000 17555, 1100 9430, 1200 9425, 1300, 1600, 1700 13625, 1800 and 1900 9355, 2200 and 2300 15405 (WSHB)

**SA'UDI ARABIA** [non] Holy Medina Radio (Arabic: *Idha'at al-Madinah al-Munawwarah*), hostile to Arabian peninsula rulers, from Iraq around 1100-1700 on 11815v, maybe one hour later now (BBCM)

**SERBIA** R. Yugoslavia made another half-hour shift, English to us now 0100 and 0200 on 9580 (Bob Thomas, CT) Poor then, better at 2200 to Europe on unannounced 9505 (Bill Westenhaver, PQ)

**SINGAPORE** SBC is dropping tropical bands to become major regional SW voice with six new 250 kW phased in from early 1994. R. One on 6155, 9530; City Sounds, in Mandarin on 6000, 9635; Malay service on 7250, 9590; Tamil on 7190; all DS relays, site next to BBC (B. Y. Yang, SBC, RNMM)

**SLOVAKIA** R. Slovakia has been asking listeners for letters supporting English broadcasts, which have been at 0100 on 5930, 7310, 9810, to the station in Bratislava, and to the President and Foreign Minister. Budget meetings discuss whether funding should continue, and on-air personnel seemed concerned about their futures (Bob Thomas, CT, *W.O.R.*)

**SOMALIA** V. of Free Somalia, also ID in English as R. Free Somalia (Somali: *Idaacada Madaxa Banaan ee Somalia*) from Gaalkacyo, seems controlled by Somali Salvation Democratic Front, but stresses it is "free from politics," shortened evening broadcast to 1600-1700 Somali, 1700-1715 English on 7499, morning irregular 0400-0515 on 7460 (BBCM)

**SPAIN** After almost two months mixing Marti on 9525, RNE went to 9540 for English at 0000, 0100, 0500 (Bill Westenhaver, PQ)

**SWEDEN** Without much warning R. Sweden retimed all its English to North America, but there are more chances: 1330 and 1430 on 15240, 17870; 0230 and 0330 on 9695 and 11650; to Latin America 0030 on same; Asia 1230 on 15240, 17740, 17865, 2330 on 11910, 0130 on 9695, 11695 (via Diane Mauer, Richard Lemke, Wolfgang Büschel)

**SWITZERLAND** SRI also retimed English without warning, 0000 and 0200 replaced by 0100 on only two direct frequencies 6135 and 9885, Brasil 17740; 0400 on 6135, 9860, 9885. No longer at 2200 either but remaining times to overseas are: 0600 on 9885, 13635, 15430, 0900 on 9885, 13685, 21820, 1100 on 9885, 13635, 15505, 1300 on 13635, 15505, via China 7480, 11690, 1500 on 9455, 13635, 15505, 1700 on 9885, 13635, 17635, 2000 on 9885, 13635, 15505, Gabon 12035 (PTT) Reduction coincides with augmentation in satellite services.

**THAILAND** Or Sor heard for first time in five years, on 6149.8

to about 1200\* with Thai vocals, jazz, Colombian QRM (David Foster, Australia, *OzDX*) Funny that VOA Udorn 1 kHz off, 1500-1800 on 7216, 1400-1500 on 9511, het Australia (Goonetilleke, Sri Lanka, UADX)

**UAE** Abu Dhabi, English at 2200-2400 moved to 13605, 11710, 9770 (Brian Alexander, and RVI *Radio World* via Steven Cline)

**UKRAINE** RUI moved English to 0100-0200 on 9685, 9860, 11720, 15195 (Bob Thomas, CT)

**URUGUAY** SODRE engineer says SW is active at 1000-0400, each paired with a MW service—6025 and 1290, 9620 and 650, 15275 and 1050—low power and not audible in Buenos Aires (Daniel Camporini via Gabriel Iván Barrera, RN *Radio-Enlace*)

**USA** Barring further delays, WRMI Miami hoped to start testing on 9555 in mid-Oct. (*World of Radio*) Services after 2300 via WRNO moved to 7395 two days after Bulgaria started bashing 7355 then when Bulgaria off to 7455, WRNO resuming 7355 but transmitter broke down (George Thurman) R. 16 Desam planned to cease Oct. 30 with the return of Aristide to Haiti; already reduced in Oct. to only 2200-2300 via WHRI 17830 weekdays (Jeff White, WRMI)

*DX Radio School*, 52-week series of two-minute talks on the basics, appears during a break in *For the People*, Mons. 1830 (probably 1930 from Nov.) on WHRI 9590 (Bill Lauterbach, MI) And repeated UT Tue. 0330 on 7315. WHRI is building new state-of-the-art digital studio in South Bend for better control of three programs at once, two via Indiana, one via Hawaii [q.v.] Most programs stay at same UT so seem one hour earlier by local American clocks—*World of Radio* UT Sat. 0130 on 7315, 0600 on 7315, 9495, Sun. 0130 on 7315, Mon. 0100 on 9495, Wed. 1900 on 13760 (Joe Hill, WHRI)

WWCR staff have been extremely busy finishing new permanent building and moving in from trailer, and No. 3 transmitter not fully utilized, definite schedule slow to materialize. But the expected week-night schedule on 5810 as UT-shifted from Nov. is: 0000 *Billy Goodman Happening Live*, 0200 *America First* with Tom Donahue, 0300 *Radio Free America* with Tom Valentine, 0500 Bill Cooper's *Hour of the Time*. *Brother Stair* on 7435 at 0300-0500. *Spectrum* prefers 5810 reception, so moved to 0300-0400 UT Suns., as does *Full Disclosure Live*, 0100-0200 UT Mons. *Tempered Steel*, Christian answer to heavy metal, UT Suns. 0600. *Self Reliance Show* of Backwoods Home Magazine with David Duffy, UT Sun. 0530-0600, or may follow *World of Radio*. *Sound Currents of the Spirit*, Sat. 2200-2300 on 15610. Any times for *W.O.R.* on 5810/15610 not set, but expected to be on WWCR-1 from Oct. 31: Fri. 2215 on 15685, Sat. 0730 on 7435, Sun. 0405 on 7435, Mon. 0000 on 7435, Tue. 1330 on 15685 (Adam Lock, WWCR) Mix of 15685 and 15610 audible on 15535 at 2015 (Bill Westenhaver, PQ) 5810 spurs at 0440 on 5856.16 and 5871.55 (Brian Alexander, PA)

WEWN harmonic from 5825 on 11650 is so strong it bothers Greece on 11645 around 0200 (John Babbis, MD) WEWN heard on spur 7615 at 0220 (Alexander) Would be mix of 7425, 7520. Though super-strong on 13615, harmonic 27230 heard at 1938, 2150 check seems transmitted and propagated there as it fades in and out (gh, NM)

Monitoradio no longer has 2-hour blocks, but two different programs depending on time, weekdays—0900 through 1500, *Early Edition* as on APR (from 1000 starting Nov. 1); 1600 through 0800, different international program with features, mailbag (Leslie Edwards, Jim Moats, Bill Westenhaver) As expected, WCSN cut to only six hours a day pending sale: 0400 and 0500 on 9840, 1800 and 1900 on 21640, 2000 and 2100 on 13770; from Nov. 9 may move at 2100 to 7510 or 5850. WSHB also has long silent periods now.

WPAL, 730, Charleston, SC, heard on 3440.1 USB at 1109 during traffic report, off at 1111; believed for program cue to helicopter (Adrian Peterson, IN)

**YEMEN** As soon as the PLO/Israel accord was signed, the PLO program via Sana'a changed, dropping PLO anthem for an Arab patriotic song and skipping usual hard-line sign-on (BBCM)

*Until the next, best of DX and 73 de Glenn!*



# Broadcast Loggings

Thanks to our contributors — Have you sent in YOUR logs?  
Send to **Gayle Van Horn**, c/o Monitoring Times.  
English broadcast unless otherwise noted.

## 0000 UTC on 7425

UNITED STATES: WEWN. Mother Angelica with discussion on Pope John Paul II via phone call-in segment. (Jim Moats, Ravenna, OH)

## 0000 UTC on 9850

UNITED STATES: WCSN. Station ID and program opening. *Monitor Radio* news at 0001. Sunday morning service at 0006. (Moats, OH)

## 0002 UTC on 6183.23

BRAZIL: Radio Nacional Amazonia. Booming signal with lots of easy-listening music in Portuguese at 2345. Multiple IDs to newscast. (David Gasque, Orangeburg, SC)

## 0010 UTC on 7435

UNITED STATES: WWCR. *Full Disclosure Live* in progress at tune-in. Bad satellite feed with rap music interference. (Gasque, SC)

## 0030 UTC on 6010

CUBA: Radio Havana. News summary to feature on Cuba's health care system. Arnie Coro's *DX'ers Unlimited* at 0040. (Moats, OH) *Latin American Newslines* same frequency and time. (Fraser, MA)

## 0030 UTC on 7355

UNITED STATES: WRNO. Religious programming with Brother R.G. Stair's ministry from South Carolina. (Moats, OH)

## 0036 UTC on 6194.57

BOLIVIA: Radio Metropolitana. Spanish. Talk up to 0130. Multiple IDs at 0125 covered by utility station nightly at 0100. (Gasque, SC) Heard 0915 on 6194.5, in presumed Aymara language. Andean music to talk and ID. (GVH)

## 0100 UTC on 6120

CANADA: Radio Canada Int'l. Station ID, program intros to newscast. *Spectrum* at 0110, a domestic version of *All Things Considered*. (Moats, OH; Tom Banks, Dallas, TX)

## 0105 UTC on 6205.5

DOMINICAN REP. Radio Quisquilla. English news at tune-in. (First English I've heard from this station), ending at 0107. Salsa music to canned ID/address at 0112. (Gasque, SC)

## 0245 UTC on 6185

MEXICO: Radio Educacion. Spanish. Classical music show. Lady announcer barely audible. VOA splash makes for very difficult listening. (Gasque, SC)

## 0250 UTC on 9605

VATICAN STATE: Vatican Radio. News report on Pope John Paul II's planned trip to Lithuania. (Kelly Bailey, Midland, AR)

## 0250 UTC on 6170.2

PERU: La Voz de la Selva. Spanish. Easy-listening music to announcer's ID at 0255 UTC. Peru's Radio Vision 2000, heard on 5131 kHz at 0150. Announcer chat to ID's at 0155. (Gasque, SC)

## 0300 UTC on 9690

CHINA: China Radio Int'l. News on Bosnia and Israeli/PLO relations with renewed hopes for continuing peace. (Bailey, AR)

## 0322 UTC on 6165

NETHERLANDS: Radio Netherlands. Spanish. U.S. pops to station QSL address and station sign-off 0325. (Banks, TX; Frank Hillton, Charleston, SC)

## 0330 UTC on 6150

MOROCCO: VOA Relay. Co-channel with CARACOL Bogota at tune-in. English/multilingual IDs at 0332. (Gasque, SC)

## 0335 UTC on 6145

GERMANY: Deutsche Welle. Tune-in to report on shopping in Germany, and an art exhibition. (Gasque, SC)

## 0336 UTC on 4875

GEORGIA: Radio Georgia, Tbilisi. Russian. Heard regularly here. Morning info show, audio is slightly distorted, // 5040 kHz better. Additional Russian programming audible on 11760 kHz at 1849. Station ID as, "Stansiya Gruziya." (Vladimir Titarev, Poltava Region, Ukraine)

## 0350 UTC on 6135

SWITZERLAND: Swiss Radio Int'l. Interval signal to station ID. News, music and features. (Gasque, SC) (Banks, TX)

## 0620 UTC on 6095

KAZAKHSTAN: Radio Alma Ata. Domestic programming noted to fade-out 0840 UTC. (Titarev, Ukraine)

## 0735 on 11950

SAUDI ARABIA: BSKSA. Arabic. Comments on national economy. Fair signal blocked by fade-in Radio Ukraine world service in Ukraine. Station heard 1835 on 6020 kHz with Arabic music with Radio Netherlands interference. (Titarev, Ukraine)

## 0920 UTC on 6090

BRAZIL: Radio Bandeirantes. Portuguese. Newscast to local ads and pop vocals. Fair copy of signal. (Banks, TX)

## 1030 UTC on 3235

PAPUA NEW GUINEA: Radio West New Britain. Pidgin. Sunday morning religious service. PNG's Radio Morobe noted on 3220 kHz at 1125 with fair signal. (Anthony Williams, Bangor, ME)

## 1040 UTC on 5956

COLOMBIA: La Voz de los Centauros. Spanish. Fair-poor copy. Music vocals to CARACOL network news. Colombia's La Voz del Guaviare noted on 6035 kHz at 1025 with Latin tunes. (Banks, TX)

## 1140 UTC on 9590

GUAM: KTWR Agana. Mandarin. Fair signal, some talk to rare symphonic music. Blocked totally by Radio Norway Int'l by 1300. (Titarev, Ukraine)

## 1200 UTC on 15220

ASCENSION ISLANDS: BBC Relay. Play *Dylan Thomas-Return Journey*. (Fraser, MA) Station logged on 11750 kHz at 2320. *Ray on Record* presents classical music to 2358. ID to 0000 news. (Moats, OH)

## 1230 UTC 15008.8

VIETNAM: Voice of Vietnam. Station sign-on in English (no sign of interval signal). Program schedule into world news at 1232. (Gasque, SC)

## 1238 UTC on 13615

BANGLADESH: Radio Bangladesh. Fair-to poor copy for closing minutes of English news. Sub-continent music to announcer updates. Station sign-off 1300. (Scott Martin, Cleveland, OH)

## 1239 UTC on 15030

COSTA RICA: Radio for Peace Int'l. *Living Enrichment Center* feature. Program included Rod Stewart tune and a really BAD singer! Station ID and schedule at 1245 to *Sound Currents of the Spirit*. (Gasque, SC)

## 1240 UTC on 15290

RUSSIA: Radio Moscow. News on a children's music festival - *Music & Musicians*. Additional monitoring; 1840 On 17760 kHz & 2215 on 12040 kHz with interview on Russia's unstable economy. (Fraser, MA) (Bailey, AR)

## 1410 UTC on 15445

BRAZIL: Radio Nacional do Brasil. English/Portuguese/Brazilian vocal music to IDs. (Fraser, MA) Nacional audible 1800 on 17750 kHz. Interval signal to ID. Substantial co-channel interferences by WYFR. (Titarev, Ukraine)

## 1420 UTC on 15674.5

HONDURAS: Radio Copan Int'l. Pop versions of classical music. Station ID at 1428 in Spanish. English mailbag program with Jeff White of RMI until 1445. Spanish program followed. (Gasque, SC)

## 1500 UTC on 9560

ETHIOPIA: Voice of Ethiopia. Fair signal for English IDs and music vocals. Station logged irregularly. (GVH/NC)

## 1650 UTC on 7499

SOMALIA: Radio Free Somalia. Somalian. Very weak national music. Slightly affected by Beijing CPBS, plus CW utility. Noted later at 1702 UTC. Announcer's comments, followed by Somalian music. (Titarev, Ukraine)

## 1830 UTC on 15580

UNITED STATES: VOA. *Africa World Tonight*. News and sports roundup at 1835. Program promo, news and music features to 1900. (Moats, OH) VOA audible on 17800 kHz at 1845 with *Tuning In the U.S.A.* (Fraser, MA)

## 1902 UTC on 15640

ISRAEL: Kol Israel. News and feature on Israeli kibbutz bakery. (Moats, OH) Israel noted on 17575 kHz at 1925. *DX Corner* on New York amateur radio operator Rubin Gross, and his illegal radio role in establishing the Israeli State. (Fraser, MA)

## 1915 UTC on 17790

ECUADOR: HCJB. *Studio 9* program with South American news topics to sports report on soccer. Repeat of *Happiness Is* program at 1930 on the Galapagos Islands. (Moats, OH)

## 1935 UTC on 17605

NETHERLANDS ANTILLES: Radio Netherlands Relay. *Happy Station* featuring Hollywood musical biographies. (Fraser, MA)

## 2000 UTC on 13620

KUWAIT: Radio Kuwait. 50-60's era music show. National news to station identification. (Ed Savage, Mt. Home, AR)

## 2044 UTC on 4860

RUSSIA: Radio Chita. Russian. Station announced as; "Chitinskoye Radio." Morning local news program with reports and interviews. (Titarev, Ukraine)

## 2055 UTC on 4840

CHINA: Heilongjiang PPBS. Chinese. National style music interrupted by station ID. Frequency schedule quote and station announcements (I think). Fair to poor signal quality. (Titarev, Ukraine)

## 2100 UTC on 5026

UGANDA: Radio Uganda. Strong clear signal (noted on USB), station signing off with national anthem. (Titarev, Ukraine)

## 2158 UTC on 11720

BULGARIA: Radio Bulgaria. Report on drilling for oil and natural gas in Bulgaria. (Bailey, AR) *Review of Current Affairs* on 15330 kHz, 2200 UTC. (Fraser, MA)

## 2315 UTC on 9655

NORWAY: Radio Norway Int'l. Report on Norway's railway system. (Fraser, MA; John T. Roberson, San Antonio, TX)



# Utility World

Larry Van Horn  
c/o MT, P.O. Box 98  
Brasstown, NC 28902

## Hit and Run Intro to the Utes

I got a very nice letter this month from Ed Cohen in Baltimore, MD, who says he is an avid shortwave listener but, "I am completely overwhelmed by the number of frequencies." In spite of trying to pick up some of the frequencies reported in this column, Ed has not had much luck. He asks, can we offer some advice on how to have some success monitoring utilities?

### Rule #1 -

Utility stations are not like shortwave broadcast stations. They do not have set broadcast times or schedules. The best thing you can do is to park your receiver on one frequency and listen for awhile. Eventually you will hear some activity. Later in this article, I will list the ten most popular frequencies that have the most activity.

### Rule #2 -

Shortwave broadcast listeners normally use the AM mode on their receivers. It's time to dust off the transmission mode switch on your receiver and try the utility modes: USB (Upper Sideband), LSB (Lower Sideband) and CW (Morse Code).

Tuning USB or LSB can be a little tricky for the newcomer. Don't be afraid to turn that tuning dial to clarify the transmitted voice coming out the receiver's speaker. With practice you'll develop an ear and a touch for the dial that will speed up the process.

### Speaking of tuning, Rule #3 -

Tune around, tune around, and tune around some more. Most utility listeners spend the majority of their time cruising the utility spectrum. What spectrum is that? Following are the general bands on which you will find utility type stations (all frequencies kilohertz):

0 - 540	7300 - 9500	14350 - 15100
1600 - 3500	9900 - 11650	15600 - 17550
4000 - 5950	12050 - 13570	17900 - 21000
6200 - 7000	13870 - 14000	21850 - 25670

Anyone who looks closely at the above ranges will notice that utility frequencies cover most of the shortwave spectrum except those portions that include shortwave broadcast stations and amateur radio frequencies. Now down to the nitty gritty. Just for Ed (the rest of you newcomers can peek, too) here are ten frequencies to get you started. Remember, your best reception will be on lower frequencies at night and on higher frequencies during the daytime.

5550	International Air Traffic Control
5696	US Coast Guard Air-to-Ground Primary (Nights)
6697	US Navy High Command (HICOM)
6753	Canadian Forces Channel
6840	Spy Number Broadcast (Evening Hours)
9023	USAF/NORAD channel
11176	USAF Global HF System
13089	US Coast Guard weather broadcast
13270	North American aviation weather
14902	Civil Air Patrol channel

Be sure to park on these for awhile. Don't expect instant speech the minute you hit these frequencies. Remember Rule #1.

This is a very quick, down and dirty intro on finding utes. I hope that it helps Ed and some of the rest of the beginners out there.

## War and Peace in Ex-Yugoslavia

In June of this year, Gayle and I did an MT feature article on listening to the civil war in the former Yugoslavia. Since that time, some additional information has become available.

### The Red Cross

The Red Cross is using six main frequencies for Yugoslavia for communications from 0900-1800 UTC. These networks are used to keep in touch with the outer-posts. From Zagreb, all convoys are advised about routes to be used and the observers are directed to their positions. This is done on a Red Cross primary frequency of 6996.0 kHz using USB.

Call sign identification used for base stations is ICRC + transmitter position. Mobile stations use Mike + three-digit number.

When operators ask units to switch to a Lima Sierra channel this means that they should use LSB as opposed to USB. In the evening hours, channels LS12 and LS14 are used for phone patches for the United Nations soldiers.

The Red Cross Yugoslavia operation has been monitored on the following frequencies:

Freq (kHz)	Channel #	Mode	Channel Usage
6990.0	LS10	LSB	Tertiary Channel
6992.0	LS9/LS16	USB/LSB	Command Network Channel
6994.0	LS12/LS17	USB/LSB	Secondary Channel
6996.0	LS13/LS17	USB/LSB	Primary Channel
6998.0	LS14/LS18	USB/LSB	Secondary Channel

### The UN Peace-Keeping Forces

These frequencies are not often used, probably due to satellite communications. Common modes heard include USB, LSB and CW.

Freq (kHz)	Call sign	User
3203.5	UN Netherlands	FRM
3250.0	UN Netherlands	PAGR/UPX
5061.5	UN Netherlands	UIM/VDX
5095.0	UN United Kingdom	TVL
5171.0	UN France	GRS
5191.0	UN Netherlands	FUM/VNX
5270.0	UN Italy	ICM/IHS
5308.5	UN France	(observer)
5383.5	UN Netherlands	FQG/KKM
5725.0	UN United Kingdom	TTV/X40 and X30
6773.0	UN United Kingdom	T3P
10159.5	UN Belgium	ON45
10232.5	UN Belgium	OP63
10403.0	UN Belgium	ON41
14500.0	UN Italy	IFD

### UN Airspace Surveillance

The bulk of the military aircraft communication has been monitored in the VHF/UHF aircraft bands. Some communication has been noted on HF. The station call sign "Foxhole" controls all flight movements



above Croatia and Bosnia-Herzegovina. Foxhole uses 6997.0 kHz. Military aircraft on patrol use the callsigns "Fox" and "Alleycat." The AWACS aircraft over land use the callsign "Magic." AWACS aircraft over international waters use the callsign "Any Eye."

All aircraft flying over Yugoslavian airspace are identified on 6997.0 kHz by a tactical identifier. Identifiers in common use are listed below:

Crawler	Aircraft flying below radar
Friendly	Civilian aircraft
Friendly Chick	Military patrol aircraft
Kilo	AWACS military aircraft/Red Cross flights
Unknown	Unknown aircraft without a flight plan
X-Ray	Serbian Aircraft or helicopter

IFF (Identification Friend or Foe) squawks assigned to the UN and the Red Cross also play a big part sorting through the confused skies over Yugoslavia. The following IFF blocks of codes have been noted in use:

0120-0137	Hercules C-130 Aircraft (Belgium)
0360-0377	Andover and Hercules Aircraft (UK)
3600-3617	Air traffic in Sarajevo airport airspace

UN aircraft, which are assigned to enforce the UN embargo on Serbia, have used the following frequencies:

3158.0 kHz	Navy aircraft
3182.0	Navy aircraft and helicopters
5310.0	Fleet Coordination and Command network (24 hours)
6997.0	UN air traffic control, mobile radar-station Foxhole
8962.0	Red Cross air transports
9043.0	Maritime reconnaissance flights
<i>(6997.0 is used during the day, 3158.0 and 3182.0 after 1900 UTC)</i>	

#### Navy Frequencies

The UN Naval forces are responsible for the sea portion of the Serbian UN blockade. To hear their operation, check the following frequencies:

3158.0	3182.0	4438.5	4547.0	4555.0	5310.0
5325.0	6747.0 kHz				

Reports are sent on these frequencies to identify all shipping activity in and out of Serbia. These reports contain the following items:

- A- ship's name
- B- position, speed and heading
- C- date of departure and arrival
- D- country of origin
- E- home-harbor
- F- name of shipping-company/transport-company
- G- callsign
- H- harbor of departure and arrival
- I - cargo
- J - type of ship
- K-Z - tactical information

#### Miscellaneous Frequencies

The following frequencies have been monitored at various times carrying the traffic indicated. Primary mode in use is USB.

6775.0	War-correspondent (English)
6881.0	War-correspondent (East-European)
6895.0	UN headquarters Cairo
6905.0	UN headquarters New York
6931.5	Red Cross Geneva
10947.0	UN headquarters Cairo

Thanks to the Dutch magazine *Radio Amateur* and in particular Mr. M for this update on monitoring situation in Yugoslavia.

## Netherlands Military Callsigns

We thank Ary Boender, a regular Ute World reporter, for the following callsigns for the Dutch military.

PBA/PBA3	Navy - Amsterdam
PBB/PBB3/PBH/PBI	Navy - Den Helder
PBC/PBC-3/5/22/24/26/28	
32/92/94/96/98/222/911	Navy - Goeree
PBD3	Navy - Vlissingen
PBE3	Navy - Ymuiden
PBF3	Navy - Rotterdam
PBK	Dutch Coast Guard (Ymuiden Rescue)
PBU3	Navy - Hoek van Holland
PFC	Naval Air Support - de Kooy
PBV/PBV4	Air Force - Volkel
PEF2	Air Force - Leeuwarden
PES	Air Force - Soesterberg

## USAF MARS Packet Network

Several times over the last few months, I have mentioned in the logging section having received tactical callsign transmissions on 6766 kHz USB and trying to identify their origin. I have also mentioned that a packet network appeared to be operating 1 kHz down in frequency at 6765 kHz.

Well, at least one of these has now been identified, thanks to Todd Dokey. Todd posted a message to the Grove BBS with the identity of the user on 6765 kHz. The USAF MARS (Military Affiliate Radio System) has a new packet network on this frequency. Other calls noted include: AGA6LA AFA6BS AFB6ML AFA6BQ AFA6BD AFA5DA.

During one of the packet streams, Todd copied the following from AGA6LA:

"AGA6LA ID MSYS LOS ANGELES AGA6LA-1/B  
AGA6LA-7/N[137.126.6.18]"

The [137.126.6.18] reminded Todd of an Internet address. When he checked it out, his assumption proved correct. The Internet address belongs to Hanscomb AFB, MA. The only other note on the address says, 'USAF M.A.R.S.'

Thanks, Todd, for the update; now solve the riddle of 6766 kHz, and your Utility World editor can rest easy again.

## Speaking of the Grove BBS...

The Grove BBS is finally up and running after a couple of touchy weeks following the move into the new offices.

I have had several enquiries regarding how to get material for this column on the BBS. It's really simple, bunky. Work up your logs and content material as an ASCII text file and upload it into the section 6 ("Private until reviewed") file area on the BBS. It's that simple.

We are always looking for good uploads to the BBS of any radio-related material. There are many new files and file areas on the BBS (including a new one on Satellites). There are also many conference areas available to discuss radio.

We now have four telephone lines that run all speeds (300 baud to 14,400 baud). Remember that the BBS is only available from 6:30 pm to 8:00 am Monday through Friday and 24 hours on the weekends. The numbers to call:

704-837-9200 704-837-7081 704-837-5957 704-837-5183

We also have a new Internet address for those of you who have that capability. You can forward messages to us at: grove@rock.concert.net.

It was nice meeting many of you at the MT convention last month. If you missed the convention, you can read a report on it in December's MT. Now it's time to check out this month's loggings in the Utility World.



## Utility Loggings

Abbreviations used in this column

AFB	Air Force Base	NOAA	National Oceanographic and Atmospheric Administration
AM	Amplitude Modulation		
ARQ	Automatic Repetition on Request		
CFARS	Canadian Forces Amateur Radio Service	Ops	Operations
Comms	Communications	PIAB	Presse- und Informationsamt der Bundesregierung
COMSTA	Communications Station		
CQ	General call for any station	POL-ARQ	Polish diplomatic ARQ teleprinter system
CW	Continuous Wave (Morse Code)		
Det	Detachment	QRM	Interference
Diplo	Diplomatic	QSY	Change Frequency
FAA	Federal Aviation Administration	RAF	Royal Air Force
FAF	French Air Force	RCC	Rescue Coordination Center
Fax	Facsimile	RFDS	Royal Flying Doctor Service
FEC	Forward Error Correction		
FEC-A	One way traffic FEC teleprinter system	RTTY	Radioteletype
FHWA	Federal Highway Administration	SAM	Special Air Mission
Green	Scrambled communications	SITOR-A	Simplex over Radio, Mode A
GHFS	Global HF System	SITOR-B	Simplex over Radio, Mode B
HF	High Frequency	Unid	Unidentified
HMCS	Her Majesty Canadian Ship	USCG	US Coast Guard
JOTC	Joint Operation Tactical Computer	USCGC	US Coast Guard Cutter
LSB	Lower Sideband	USN	US Navy
Meteo	Meteorological	USB	Upper Sideband
MFA	Ministry of Foreign Affairs	USS	United States Ship
MARS	Military Affiliate Radio System		
m/v	Motor Vessel		

All frequencies in kilohertz (kHz), all times in UTC. All voice transmissions in English unless otherwise noted.

- 122.3 OUA23-Danish Navy Stevns with V CW marker at 1440. (Ary Boender-Neth)
- 123.7 DCF42-PIAB Bonn, Germany, testing using FEC-A at 1435. (Boender)
- 435.0 SAA-Karslkrona Radio with weather forecast in CW at 2132. (Robin Hood-UK)
- 436.5 CUL-Lisbon Radio working m/v *Argo Explorer* in CW at 2138. (Robin Hood-UK)
- 438.0 EAV-Cabo la Nao Radio with traffic list in CW at 2203. (Robin Hood-UK)
- 439.0 OST-Oostende Radio, Belgium, with CW traffic list at 2006. (Boender)
- 442.5 FFB-Boulogne-sur-Mer Radio, France, with CW navigation warnings at 0800. (Boender-Neth)
- 444.5 PCH-Scheveningen Radio, Netherlands, working m/v *Granada* in CW at 0711. (Boender-Neth)
- 447.0 ICB-Genoa Radio working SXIH in CW at 2142. (Robin Hood-UK)
- 524.0 ICB-Genoa Radio with navigation warnings in CW at 2150. (Robin Hood-UK)
- 1689.0 B404 (Fishing Beacon) in CW at 0524. (Gasque-Orangeburg, SC)
- 1692.0 KA00237 (Fishing Beacon) in CW at 0517. (Gasque-SC)
- 2017.5 Gengrel Meteo with air reports using 100 baud RTTY at 2119. (Robin Hood-UK)
- 2148.0 OBN6-M/V *Pernille W* working Lyngby Radio using SITOR-A at 2126. (Robin Hood-UK)
- 2429.0 MKL-RAF Pitreavia, Scotland, with weather in CW at 2209. (Robin Hood-UK)
- 2572.0 WLO-Mobile Radio, AL, in USB at 0348 with high seas forecast for West Atlantic and Caribbean. (Bill Fernandez-MA)
- 2733.0 SDJ-Stockholm Radio with traffic list and weather using USB at 2150. (Robin Hood-UK)
- 3231.5 DHJ57-Berlin Meteo, Germany, with 100 baud RTTY coded weather at 2015. (Boender-Neth)
- 3279.0 USAF Croughton Meteo with 100 baud RTTY coded weather at 0025. (Boender-Neth)

- 3349.0 NNN0HUC working NNN0RYB with informal conversation about hamfest and vacation in USB at 0215. (Gasque-SC)
- 3452.0 I3-Irish military with SITOR-A 5 letter group messages at 2250. (Boender-Neth)
- 3582.0 FDY-FAF Orleans, France, with 50 baud RY RTTY test tape at 2315. (Boender-Neth)
- 4050.6 CG Symphony working Netherlands CG Center with ops normal report in USB at 0607. (Boender-Neth)
- 4125.0 WHV884-Paducah, KY, calling any station for a radio check in USB 1120. (Neal Perdue-Madison, AL)
- 4149.0 WPE-Jacksonville, FL, working WBN3016-Tug Ranger in USB at 0608. (Lonnie Bunn-Raleigh, NC)
- 4213.5 UFN-Novorossiysk Radio with SITOR-A idler at 2145. (Robin Hood)
- 4218.5 UDH-Riga Radio with SITOR-A idler at 2147. (Robin Hood-UK)
- 4231.5 UVA-Gelendzhik Radio with traffic list in CW at 1600 and parallel 8455.0 12729.0. (Robin Hood-UK)
- 4295.0 PKF-Ujung Pandang, Indonesia, with CQ CW marker at 1000. (Eddy Waters-Australia)
- 4298.0 NOJ-USCG Kodiak, AK, USA sending weather fax maps at 1011. (Waters-Australia)
- 4334.0 XST-Guindao Radio, China, with CQ CW marker at 1029. (Waters-Australia)
- 4372.0 Z8C working Screwtop in USB at 2209. (Bunn-NC)
- 4483.0 VM2PC-Penta COMSTA Sydney, Australia, in USB calling vessels then weather forecast at 0638. (Waters-Australia)
- 4560.0 CFH-Halifax military, NS, working unid ship at 0256, RTTY QRM on frequency, advised ship to QSY to channel A5B. At 0514, HMCS *Porte St Jean* (YNG-180) female radio operator working CFH, for radio check. Training/port control vessel. (Richard Baker-OH)
- 4665.0 VLB2-Israeli Mossad number station in AM at 0349. (Gasque-SC)
- 4967.0 NDT-USN Yokota, Japan, with weather fax charts at 1159. (Waters-Australia)
- 5015.0 German female 3/2-digit number station in AM at 0507. (Gasque-SC)
- 5064.0 9MB-Penang, Malaysia, with CQ CW marker at 1155. (Waters-Australia)
- 5405.0 JM2-Tokyo Meteo, Japan, with fax weather maps at 1145. (Waters-Australia)
- 5410.0 VJD-RFDS Alice Springs, Australia, Outpost Homestead calling 9VJQ (Ballarat) in USB at 1008. (Waters-Australia)
- 5415.6 Spanish female 5-digit number station in AM at 0300. (Jeff Jones-Tracy, CA)
- 5437.0 Israeli Mossad? Female with callup then into 5 letter group text in AM at 0335. (Fernandez-MA)
- 5604.0 TORS COVE-Rainbow Radio with several aircraft giving company data/position reports in USB at 0333. (Fernandez-MA)
- 5691.5 Whiskey Bravo and other Whiskey units passing data. Heard at 0249 in USB, possible USN comms. (Baker-OH)
- 5696.0 Coast Guard Rescue 1703 working San Francisco at 0140 regarding a Falcon aircraft ditching, in USB. (Bill Ballowe-Benicia, CA) See *Anderson intercept on 13354.0-Larry*.
- 5700.0 Mess Kit with radio check on Papa 381 with Test Prod in USB at 1608. Moved to Xray 904 (9014.0) then Xray 905 (11226.0) and joined by Material. (Bunn-NC)
- 5711.0 GJR working J2T in USB at 1100. (Harry Riddell-Rochester, NY)
- 6224.0 WPE-Jacksonville, FL, working WBN3016-Tug *Defender* in USB at 0657. (Bunn-NC) WHW283-Pt. Isabell, TX, working m/v *Linda Cruz* and other Cruz m/v in USB at 2113. (Perdue-AL)
- 6227.0 WHW414-Panama City, FL, calling m/v *Mr. Crockettin* USB at 2113. WHG-855 Tampa, FL, working m/v *Stephanie Dann* (Dann Ocean Towing Co) in USB at 1057. (Perdue-AL)
- 6439.0 UKK3-Nakhodka Radio, Russia, CIS, with CQ CW marker at 1036. (Waters-Australia)
- 6522.0 Penta Gosford Radio, Australia, giving weather warnings in USB at 0943. (Waters-Australia)
- 6557.0 Heard the following 'QRA DE Z3S OO IMI' in CW at 0400. Repeated over 3 minutes and nothing else. Who? (Gordon Levine-Anaheim, CA) *Anybody out there that can help Gordon on this one-Larry?*
- 6622.0 Madang Control, Papua New Guinea, calling an Air New Zealand flight in USB at 0938. (Waters-Australia)
- 6683.0 Andrews AFB working SAM 86971 on F-118 in USB. (Jones-CA)
- 6750.0 Kilo, Lima, Foxtrot, Quebec, Delta and Echo trying to set up a data link on another frequency (Alligator Playground). Heard at 0424 in USB. At 0531 Kilo worked Oscar asking if his JOTC was up. (Baker-OH)
- 6762.5 66/75 on Papa Kilo with signal checks and equipment testing data comms. Sounded like non-military personnel testing with military equipment (contract). (Fernandez-MA)
- 6745.0 CIO2-Israeli Mossad number station in AM at 0348. (Fernandez-MA)



6788.0	Tango 06 working Romeo. Passed alpha report like ones passed around Haiti. Mentioned 'Father' frequency as Excalibur plus 5. In USB at 1140. (Riddell-NY)	10478.0	8WD9-New Delhi, India with FEC-A RY test tape to IWA6 at 1300. (Waters-Australia)
6815.6	BOM/UE6T passing a relay from COMSTA Miami for BOM about moving to a different frequency (given in coded form) in USB at 0121. (Fernandez-MA)	10600.0	Spanish female 4-digit number station in AM at 2324. (Robinson-TN)
6818.5	Tenement trying to contact Back Bench, negative contact. Tenement then worked Evans to relay message to Back Bench. Message composed of 15 three letter/number groups in USB at 0200. (Jones-CA)	10891.0	WWJ44-FHWA Dahlonaga, GA, and WWJ82-FHWA Grand Island, NE, in USB at 1737 discussing data modes. WWJ82 operator said FEC (SITOR-B) was the primary mode, but indicated PACTOR might also be evaluated. (Metcalfe-KY)
6853.0	Spanish female 5-digit number station in AM off at 0215. (Gasque-SC)	10970.0	SNY2-Israeli Mossad in AM at 0235. (Fernandez-MA)
6900.0	Possum, Jay Hawk, Mongoose on frequency Hotel saying haven't seen any aircraft today and were hearing each other on longwire antennas in USB at 1641. (Robinson-TN)	11059.0	SAM 205 on F-906 in USB working Andrews AFB with secondary frequency of F-283 (11052.0) at 0200. (Jones-CA)
6977.0	CIW8119 working CIW824-Halifax, NS, and CIW605-Ottawa in USB at 2308. (This is a CFARS frequency.) (Bunn-NC)	11176.0	Bronco 10 working Offutt AFB GHFS for MARS frequencies to use, 13993 and 20870 given. In USB at 0122. (Baker-OH)
7453.0	Single Letter HF Beacon 'R' in CW at 2216. (Robin Hood-UK)	11220.0	Tenspot working McClellan in USB at 2120 then moved to 13211.0 (Bunn-NC)
7475.9	FAA stations KLB488-Indianapolis working KLB86 in USB at 2009. (Jeff Haverlah-Humble, TX)	11243.0	Standoff working McClellan requesting primary and secondary frequencies for Tone Deaf at 1554 in USB. Passed Xray 905/210. (Bunn-NC)
7552.0	Cannon Base and Demon Base with USB test counts at 1140. (J. Metcalfe-KY)	11248.0	Ocean working Golf asking about contact on Bravo in USB at 2323. (Robinson-TN)
7706.5	Abnormal 10-Vandenberg AFB, CA, in USB at 1524. Also heard Abnormal 10 and several other stations on 5822.0, 10352.0, 11510.0, 13218.0, 13900.0 and 14987.0 from 1400-1700. (Metcalfe-KY)	11258.0	Assurance and Mandrel using this frequency (Tango Sierra Bravo) for USB voice and Tango Echo (unknown) for data. Heard around 2300. (Metcalfe-KY)
7741.0	NHIC-USCGC <i>Vigilant</i> calling Dolphin 16 in USB at 2352. Other stations active here gave a position report for a dirigible. (Metcalfe-KY)	11407.0	Air Force 1 working Andrews AFB on F-537 with phone patch to AFCC in USB at 2310. (Jones-CA)
7871.0	English female 3/2-digit number station in AM at 1430. (Jones-CA)	11413.0	Andrews AFB working SAM 86971 in USB on F-198 at 1720. Andrews AFB with radio check for SAM 26000 in USB at 1920. (Jones-CA)
8000.0	In LSB, two Spanish stations trying to talk over another station that was playing music (Spanish). Seems there is always something bizzare here on LSB from time to time. At 0121. (Fernandez-MA)	11633.0	Spanish female 5-digit number station in AM at 0408. (Jones-CA)
8125.0	Coast Guard District 9 in USB comms with another Coast Guard station at 1654. This is an FAA frequency. (Metcalfe-KY)	12585.0	UBN-Mariupol Radio, Ukraine, with SITOR-A messages to ships at 1038. (Waters-Australia)
8140.0	Australian Skycom calling an aircraft at 0602 in USB. (Waters-Australia)	13354.0	Mayday call from aircraft N132H with engine problems. RCC Long Beach had pilot ditch next to a motor vessel in the area. Pilot was okay, in USB at 0130. (Norman P. Anderson-Santa Ana, CA)
8246.0	Ukraine. Motor vessels from Danube communicating with Izmail (Danube's Delta) 0835-0900 in USB. Radio Grozny 0900, "Radio teplokhod Dnepr" (from somewhere near Comarno, Slovakia) all in USB. (Vladimir Titarev-Paltava Region, Ukraine) <i>Welcome to the column Vladimir, I am looking forward to more from you in the future as you are our first Ukrainian reporter-Larry.</i>	13392.0	DFZG-MFA Belgrade, Serbia, with FEC-A news in Serbian at 2330. (Waters-Australia)
8247.0	A few Estonian based ships calling Tallinn Radio in Russian at 1940. They were giving their coordinates mostly in the Baltic and North Seas in USB. (Titarev-Ukraine)	13825.0	SAM 31683 on F-533 working Andrews with phone patch in USB at 1657. Moved to F-125 (11615.0) primary at 1757. (Jones-CA)
8294.0	WPE-Jacksonville, FL, working WBN3013-Tug <i>Century</i> , WBN3012-Tug <i>Ensign</i> , WBD3014-Tug <i>Patriarch</i> , WBN6510-Tug <i>Sentinel</i> , WBN5040-Tug <i>Pioneer</i> in USB at 2317. Also heard WLX-Honolulu, HI, working tug WTT3598 in USB at 0601. (Bunn-NC) WHW337-Mobile, AL, working m/v <i>Ft. McHenry</i> in USB at 1442. (Perdue-AL)	13974.0	NNN0CCN-USS <i>Monterrey</i> (CG-71) working NNN0ZTI in USB at 2025. (Perdue-AL)
8431.5	UAT-Moscow Radio with SITOR-A idler at 2220. (Robin Hood-UK)	13976.0	HBD20-MFA Berne, Switzerland, with SITOR-A messages in German and Swiss at 0810. (Waters-Australia)
8716.0	Royal Navy Coastal Control (Channel FA) with distinctive 2 tone signal. Heard at 0610 in USB, still good at 0700. (Baker-OH)	14391.5	NNN0NGW-USS <i>George Washington</i> (CVN-73) working NNN0PRQ with phone patch traffic in USB at 1645. (Perdue-AL)
8771.0	Fairfield Air Ops working Sinatra Det at 2040 in USB. (Riddell-NY)	14441.5	NNN0NAL-USS <i>Abraham Lincoln</i> (CVN-72) working NNN0TDU at 2330 in USB. NNN0CTP-NOAA ship <i>Discoverer</i> calling anyshore station in USB at 0038. (Perdue-AL)
8993.0	Navy Researcher 442 calling MacDill AFB in USB at 2017. (Mike Starr-Burton, MI)	14447.0	NNN0NTR-USS <i>Theodore Roosevelt</i> (CVN-71) working NNN0NSB in USB at 1710. (Perdue-AL)
9013.0	Dragnet Uniform briefly working Coffin Corner and Okie Sam on a duplex basis in USB with 9023.0 being the transmit frequency for the ground units and 9013.0 transmit for Dragnet Uniform. Heavy QRM from Raymond 7, Dragnet 6, High Test 2, and a couple of Ouzo flights on 9014.0 at 1904. (Haverlah-TX)	14948.0	DFZG-MFA Belgrade, Serbia, with RTTY pooled news Reuters, AFP, etc in Serbo-Croatian. (Waters-Australia)
9014.0	Scott 2 working Raymond 7 in USB at 1455. 8880 working Sierra. 8880 asked permission to lower its boom and refuel 2 F-16 aircraft from 58th Fighter Wing in USB at 1700. (Riddell-NY)	15037.0	MPD-Unid station sending V CW marker at 1250. (Gasque-SC)
9017.0	Lonesome working Mayflower for radio check on Xray 904. Also moved to secondary frequency 6730.0 (Xray 903) in USB at 1526. (Bunn-NC)	15048.0	MacDill AFB working SPAR 84 with phone patch from aircraft to Secretary of Defense in USB at 2020. Les Aspin was making a major job offer. (Haverlah-TX)
9033.0	Dragnet Tango calling Warrior and Crisco in USB at 1450. (Riddell-NY)	15821.0	Trout 99 working Andrews AFB. Also checked F-18, F-533 (13825.0), F-988 and F-226 in USB at 1529. (Jones-CA)
9043.5	Elvis (somewhere in Mississippi), Razorback and Gray Team with weather data in an unknown mode. Signal analysis indicated 200 baud ASCII, but if so, it must have been encrypted. Stations coordinated in USB voice. (Metcalfe-KY)	16304.0	OMZ-MFA Prague, Czechoslovakia, with RTTY diplo bulletin Czechoslovakia then Czech text at 0706. (Waters-Australia)
9106.0	Charleston calling Little Rock several times in USB at 1920. (Riddell-NY)	16606.0	Two Italian ships in communications in USB talking about positions at 2042. (Arsenio Fornaro-Brooklyn, NY)
9138.2	Some comms here giving time marks then into green comms at 1125 using LSB. (Riddell-NY)	16907.0	MFA Cairo, Egypt, with SITOR-A messages in Arabic at 0617. (Waters-Australia)
9921.0	Andrews AFB working SAM 56973 in USB at 2200. (Jones-CA)	16964.0	NMO-USCG Honolulu, HI, with a CW CQ marker at 0350. (Waters-Australia)
10015.0	NOAA 42 with phone patch to Miami Monitor via MacDill in USB at 2239. (Henry Brown-East Falmouth, MA)	17040.0	UKA-Vladivostok, Russia, CIS, with a CW CQ marker at 0925. (Waters-Australia)
10090.0	Russian Khabarovsk VOLMET with aviation weather in USB at 0939. (Waters-Australia)	17231.5	UJY-Kaliningrad Radio with CW ID at 0711. (Robin Hood-UK)
10130.0	RBW48-Murmansk Meteo, Russia, CIS, with fax weather charts at 0735. (Waters-Australia)	17245.0	Royal Navy carrier GCDG-Ark Royal (R-07) working Portishead Radio, England, with radiotelephone traffic in USB at 1745. Portishead on 17245 and Ark Royal on 16363. (Baker-OH)
		17435.0	Spanish female 5-digit number station in AM at 0035. (Jones-CA)
		17460.0	Durant working unid station in duplex, said going to Bravo 7 at this time in USB at 1930. (Jones-CA)
		18063.0	Andrews AFB working SAM 681 in USB at 0042. (Jones-CA)
		18082.0	SNN299-MFA Warsaw, Poland, with POL-ARQ Polish messages at 0457. (Waters-Australia)
		19690.0	KMI-San Francisco Radio, CA, with SITOR-B traffic list at 0700. (Waters-Australia)



# The Scanning Report

**Bob Kay**

c/o MT, P.O. Box 98  
Brasstown, NC 28902



## Scanning the U.S. Mail, United Parcel and Armored Trucks

Mail service in 1639 was unregulated and deliveries were irregular. Mail was deposited at taverns and ship captains were paid one penny per letter to transport mail across the sea to Europe. In 1753, Deputy Postmaster Benjamin Franklin recognized the need for a more regimented delivery service. He ordered routine inspections of mail depositories, used stagecoaches to deliver mail and began night deliveries between major cities.

To mail a letter in 1816, the sender paid 25 cents. Upon delivery, the addressee paid an additional 2 cents to the letter carrier. By the year 1847, Congress approved the establishment of uniform postage rates and the sale of adhesive backed stamps. As a result of this action, postal rates were reduced and mail delivery became a reliable service. In 1911, mechanical sorting devices, pneumatic tubes and air mail increased the volume of mail without increasing delivery time. Zip codes, established in 1963, provided three day mail service to practically any location in the United States.

Today, mail delivery is the responsibility of an independent agency known as the U.S. Postal Service. Every year, during the months of November and December, the Postal Service handles a deluge of holiday mail. To deliver such a large volume of letters and packages, the Postal Service will utilize a fleet of vehicles including tractor trailers, mid sized trucks, vans, cars and Jeeps.

The period between Thanksgiving and Christmas will provide you with the perfect opportunity to hear a variety of postal communications. Delivery vehicles, vehicle maintenance and road side repairs are a few of the services that utilize radio communications. Hobbyists that live near a large postal center can also monitor maintenance, equipment and the supervisory personnel who are responsible for handling, sorting and loading the mail.

Postal security is another service that will be active during the holidays. Postal security agents are responsible for investigating mail fraud, theft and other mail related criminal activities. Security communications may include building security, routine security checks and actual postal investigations. It's important to remember that postal investigators and your local authorities will often work together. If you monitor postal agents in the field, check your local police and FBI frequencies for activity.

*During the holidays, mail and package delivery are only a few of the services that will utilize two-way radio.*



The postal frequencies for Philadelphia are:

164.70 166.275 169.00 169.60 409.225 412.275 418.30

Additional frequencies that may be utilized nationwide include:

169.850 171.175 408.00 48.050 409.100 409.225 409.525

### Private Companies

As you listen to the postal frequencies, don't forget to monitor the competition. United Parcel Service (UPS) has shipping terminals located throughout the United States. Loading dock supervisors and a limited number of vehicles utilize radio communications. If your area has an UPS air terminal, it may be possible to monitor UPS cargo flights.

The UPS terminal in Philadelphia utilizes the following frequencies:

129.425 (AM)	461.2375	461.7625	463.4375
463.6375	463.9375	464.1875	464.6625
464.9125			

The frequencies for your area could be identical or fall within the same frequency ranges.

Armored truck companies are another pick-up and delivery service that will be especially busy during the holidays. In the Philadelphia area, armored vehicles have been monitored on 159.495, 159.810, 159.765, and 464.85.

Again, the specific frequencies change between cities and states. To find the armored vehicle frequencies in your area, check out the type of antenna that is mounted on the armored vehicle. As you probably already know, it's possible to estimate the frequency band by identifying the antenna. If you need assistance, refer to the "Listener's Guide," page 29, in the front section of *Police Call*.

As you look for antennas on armored vehicles, it's important to note that armored companies have started to utilize cellular phones. In certain areas, cellular phones have completely replaced two-way radio communications.

The Postal Service, United Parcel Service, armored delivery vehicles and thousands of independent service companies are dedicated to providing their customers with fast, dependable service. As a scanner buff, you can depend on your local delivery service to provide hours of non-stop scanning action. Listening to and logging the activity during the holidays will provide you with new frequencies that can be monitored throughout the year.

### Treasure Hunt

If you've participated in past Treasure Hunts, you already know that we rarely have more than one or two prizes to give away. It's also impossible to respond to everyone who enters. The only folks who receive a response are the winners.

For our November/December Treasure Hunt, I'll be giving away two prizes to *everyone* who enters. I have a truck load of wallet size, frequency allocation cards—two for everyone. To win your cards, simply find the answers to the following:

1. The rear panel of the Bearcat 800 XLT has two antenna connectors. True or False?
2. Name the agency that utilizes the frequencies between 144.00 and 148.00 megahertz.
3. What percentage of the signal is lost at -3dB?
4. A novice class Ham license requires a Morse code test. True or false?



5. Provide a radio frequency that is "off limits," to the scanner listener.

Each participant will receive one VHF/UHF card and one Federal allocation card. When you're in the field, the cards can be used to quickly locate the frequency ranges of specific agencies. To receive your cards, an SASE *must* accompany your entry. Send your answers to the Treasure Hunt, P.O. Box 98, Brasstown, NC 28902.

## Frequency Exchange

Grab your gloves and scarf, we're off to visit Greg Morrow, in **Portland, Maine.**

154.695 State wide emergency  
155.625 Cumberland County Sheriff  
154.995 York County Sheriff  
155.070 Oxford County Sheriff  
154.070 Oxford County Sheriff  
154.310 State Fire  
154.935 State Police  
155.490 Portland Police  
155.790 Falmouth Police  
153.665 Windham Police Region #1  
155.535 Windham Police Region #2  
155.550 Region #5

Are you ready for a cup of hot chocolate? Chad Cessna has invited everyone to his home in **Altoona, Pennsylvania.**

33.42 Cambria County Tactical fire  
33.48 Cambria County fire operations  
33.54 Cambria County fire S.E. operations  
33.76 Cambria County fire S.W. operations  
33.94 Cambria County fire North operations  
47.42 Red Cross  
45.92 Dr. Harnett medical  
154.515 Ebensburg Ambulance  
47.66 Tyrone Hospital  
37.42 Altoona Police  
45.10 Bedford County Sheriff  
45.14 Bedford County Sheriff  
45.20 Blair County Sheriff  
154.025 Indiana City Police  
155.010 Indiana City Police  
155.505 Bedford State Police  
158.730 Altoona Hospital  
460.250 Altoona State University  
155.280 Blue Knob Ski patrol  
47.14 Penn Dot channel #1  
47.30 Penn Dot channel #2  
453.70 Adams County highway maint.  
47.70 Highland Sewer & water  
48.40 Penelec Power Co.  
48.46 Penelec Power Co.  
48.70 People's Natural Gas  
161.25 Blacklick railroad  
161.10 Blacklick railroad  
160.47 Chessie system  
161.80 Conrail  
150.89 Eckenrod's Sunoco  
150.29 Mid-state auto club  
152.33 Altoona Taxi  
170.875 Loretto Prison

Chad's full list of Pennsylvania frequencies includes over 250 frequencies for Bedford, Blair, Cambria, Clearfield, Indiana, Somerset and

## GUIDE TO FACSIMILE STATIONS

13<sup>th</sup> edition • 400 pages • \$ 35 or DM 50

The recording of FAX stations on longwave and shortwave and the reception of meteorological satellites are fascinating fields of radio monitoring. Powerful equipment and inexpensive personal computer programs connect a radio receiver directly to a laser or ink-jet printer. Satellite pictures and weather charts can now be recorded automatically in top quality.

The new edition of our FAX GUIDE contains the usual up-to-date frequency lists and precise transmission schedules - to the minute! -, including those of all US Coast Guard and US Navy stations worldwide. The new Bracknell and Washington meteo telefax polling services are also described. The book informs you with full details about new FAX converters and computer programs on the market. The most comprehensive international survey of the "products" of weather satellites and FAX stations from all over the world is included: 337 sample charts and pictures were recorded in 1992 and 1993! Here are that special charts for aeronautical and maritime navigation, the agriculture and the military, barographic soundings, climatological analyses, and long-term forecasts, which are available nowhere else. Additional chapters cover abbreviations, addresses, call sign list, description of geostationary and polar-orbiting meteorological satellites, regulations, technique, and test charts.

Further publications available are *Guide to Utility Radio Stations* (11<sup>th</sup> edition), *Radioteletype Code Manual* (12<sup>th</sup> ed.) and *Air and Meteo Code Manual* (13<sup>th</sup> ed.). We have published our international radio books for 24 years. They are in daily use with equipment manufacturers, monitoring services, radio amateurs, shortwave listeners and telecommunication administrations worldwide. Please ask for our free catalogue, including recommendations from all over the world. For recent book reviews see MT 4/93 page 90 and SPEEDX 2/93 page 43. All manuals are published in the handy 17 x 24 cm format, and of course written in English.

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West Moreland Counties. To receive the list, send \$2.00 dollars and #10 SASE to the Frequency Exchange, Post Office Box 98, Brasstown, NC 28902.

As we continue southward, let's take a ride aboard the Southern Railroad, in **Norfolk, Virginia.** Our Engineer is Rick Abrey, and here are Rick's favorite frequencies.

160.245	Dispatch	160.83	Train to dispatch
160.32	Sheffield yard	160.95	Sheffield tower
160.365	Sheffield car men	161.085	Sheffield hump
160.515	PBX	161.25	Sheffield hump
160.665	Sheffield yard	161.43	Sheffield yard
160.74	Sheffield yard		

Your cold nose and ears will love our next stop. Welcome to the home of Garrett Stevens, in **Muscle Shores, Alabama.** Warm up with an interesting sampling of southern frequencies.

48.94 Texas Eastern gas  
154.92 Alabama State Police  
155.37 Alabama State Police  
154.785 Franklin County Sheriff  
159.15 Franklin County Sheriff  
154.995 Tishomingo County Sheriff  
155.85 Red Bay Police  
155.505 Alabama Bureau of Investigation  
151.325 State Forestry  
151.175 Alabama fish & game  
151.22 Alabama fish & game  
151.25 Alabama fish & game  
173.025 NASA audio circuit, Huntsville  
451.575 Occidental Chemical Co.  
456.575 Occidental Chemical Co.



460.075 Florence Police  
 465.10 Florence Police hand held  
 465.50 Sheffield Police  
 451.125 Muscle Shores Utility Co.

Our next invitation arrived from Bill Miller, in **Jackson, Mississippi**. During the winter months, Bill enjoys the warm weather by sitting outdoors and monitoring the State Police.

42.02 42.05 42.12 42.16 42.25 42.28 45.10  
 45.14 45.18 45.22 45.32 45.78

Uh-oh, button your coat. We're leaving the warm air and heading north to **Wichita, Kansas**. Bob Yuma is the news director for KSNW, TV, and his invitation included the following monitoring opportunities:

44.98 Kansas Highway Patrol  
 45.14 Aerial speed traps  
 146.94 Storm net-tornado chasers  
 148.075 McConnell AFB—commander's net  
 151.10 Turnpike toll booth phone patch  
 154.325 Newton Fire  
 154.68 Turnpike Police  
 154.845 Harvey County Police  
 155.25 Hutchinson Police  
 155.58 Reno County Sheriff  
 163.20 Federal Marshal  
 163.8125 Federal Marshal  
 163.9125 FBI repeater  
 173.585 McConnell AFB crash trucks  
 453.65 Butler County fire  
 453.975 Cowley County civil defense  
 460.075 Butler County Police  
 460.10 Winfield Police  
 460.125 Haysville Police  
 460.15 Andover Police  
 460.225 Summer County Police  
 460.50 Wichita State University  
 462.95 Lifewatch—paramedics

Bob claims that Wichita County has moved to a trunked system. However, most of the frequencies listed above have remained unchanged.

Our final invitation takes us to **Oakdale, California**. Bill Tonkelson lives nearby, and he has provided us with his popular frequencies.

45.96 Schools 154.43 Fire  
 153.77 Fire 458.875 County use

It's easy to feature your favorite frequencies in the pages of Monitoring Times. Send your lists to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902. Computer disks are welcomed and all requests for anonymity will be granted.

## Scanner Tip-Off

The local police in Royal Oak, Michigan, were looking for a man and woman who had stolen a van. The suspects abandoned the van in a gas station and calmly walked away.

After a description of the suspects was broadcast over police radio, a scanner buff saw the couple walking past his home and called 911. Police responded to the location and quickly apprehended both suspects. (News clipping from *Daily Tribune*.)

## Shopping Mall Theft

If you take your scanning equipment to the shopping mall, watch out for thieves. A 38 year old paraplegic had his scanner stolen while he was

using the restroom. The incident occurred in a shopping mall near Fairfield, California. The 17 year old thief was not apprehended. (News clipping from *Daily Republic*.)

## Reach Out and Bug Someone

In the August 93 column, I mentioned that some cellular phones will "go live" without producing an audible ring. This unique feature is called "Automatic Answer," and it allows the phone to be used as a high tech bugging device. The user places the phone in a strategic location, dials the phone number and then eavesdrops on the conversations within the room.

Automatic Answer was originally designed as a safety feature. It permitted the user to receive a call without pressing any buttons—a nifty feature when you're driving on the expressway.

The silent ring feature however, is an option that can only be found on a few select models. The majority of phones equipped with Automatic Answer will produce two audible rings that cannot be muted. Cellular owners who are handy with a few basic hand tools have been installing miniature push button switches that deactivate the ringer.

Cellular phone modifications that are designed to silence the ringer are growing in popularity. It would appear that an alarming number of cellular owners are using their phones to reach out and bug someone.

## Scanning and Gambling

In the state of New Jersey, the Casino Control Commission prohibits the use of electronic devices on the gaming floor. According to Bill Cole, of Cape May, New Jersey, the rules prohibit any radio that is capable of receiving two-way radio communications. Anyone apprehended with a scanner radio or similar device would be subject to arrest by the Division of Gaming Enforcement.

The regulation only applies to the gaming floor. It's perfectly legal, for example, to scan from a hotel room within the Casino. If you decide to go, be sure to pack the following frequencies:

### Bally's

464.10 Security  
 464.325 Maintenance  
 464.575 Surveillance

### Resorts

466.2625 Surveillance  
 464.675 Security

### Sands

463.325 Security  
 463.40 Security  
 464.975 Operations

### Showboat

461.225 Operations  
 461.625 Security

### Trump Plaza

461.5125 Security  
 461.825 Operations  
 463.35 Security

### Division of Gaming Enforcement

460.175 Operations  
 460.25 Operations

## There Should Be a Law

A letter from John Denver, of Boston, Massachusetts, asked an intriguing question. "Are there any locations in the United States that prohibit the use of cellular car phones while driving?"

Talking on a cellular phone while driving is a skill that some folks haven't mastered. Nearly everyone has witnessed the erratic driving habits of a motorist talking on a cellular phone. If such a law doesn't exist, maybe it's time that we introduced one. The "Electronic Communications Vehicle Act" (ECVA), would prevent the use of cellular phones from a moving vehicle. It could be our "pay-back" to the cellular industry for pushing the passage of the Electronic Communications Privacy Act (ECPA).

What do you guys think? Send your comments to the Scanning Report, P.O. Box 98, Brasstown, NC 28902.



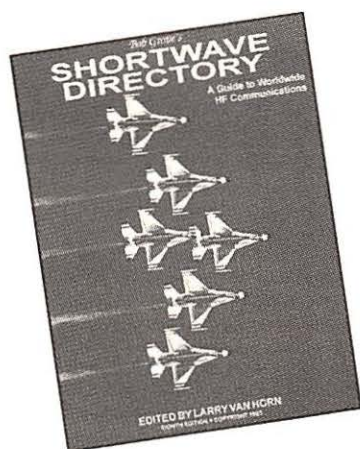
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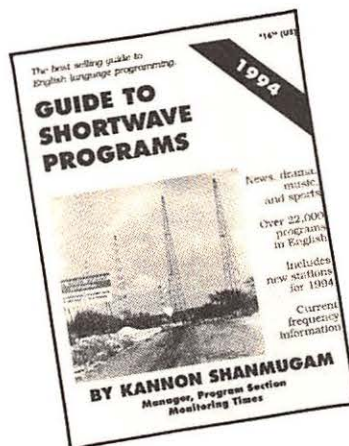
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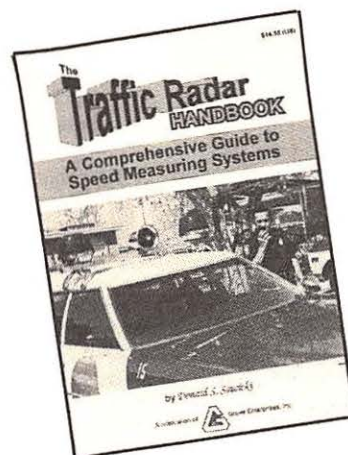
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## Code Busting with Uncle Skip

In case you haven't noticed, we are in the midst of a minor revolution in the radio hobby. On February 4, 1991, the FCC eliminated the Morse code requirement for the Amateur Radio Technician's Class License. In the two-plus years since the Feds made this move, thousands of folks have jumped into the ham radio pool. Amateur radio has not seen such a surge of newcomers since the CB boom of the early seventies. Old Uncle Skip has had the privilege of "Elmering" quite a few of his computer hobbyist friends into the radio realm with tales of packet radio adventure. With full amateur radio privileges above 30 MHz you would think everyone would be satisfied.

However, many "No Code" hams are now looking to increase their amateur activities with access to the HF portions of the ham radio spectrum. There is a lot of fun going on below 30 MHz, too, and they want to get in on it. But the HF bands come with a steeper learning curve. In addition to radio law, theory and practice tests such as the one required for the Technician's ticket, the hobbyist must demonstrate Morse code proficiency in 5, 13 or 20 word per minute increments.

Learning the International Morse Code has always been shrouded in some mystique. Maybe it has something to do with the cloak and dagger image attached to it in spy novels. It could also be that many people see learning the code as being akin to mastering a foreign language. Well, Old Uncle Skip is here to tell you that most of the mystery surrounding Morse code can be spread on the flower beds to help the posies come up in the spring, because it is pure manure! Anyone who has the tenacity to involve themselves in the radio monitoring hobby has already demonstrated the "stick-to-itiveness" needed to master Morse code. Further, modern technology has come up with a few ways to help you over the traditional hurdles. So strap on your headphones and pin on your James Bond badge, Bunkey, and...

### Let's Get Started!

Morse code is a process of hearing a pattern of dots and dashes and translating them into letters, numbers and punctuation marks. The patterns are distinctive and become more recognizable with practice. Many of the advertisers in the pages of *MT* market code practice tapes and computer programs that allow you to first learn the individual characters and then practice copying the characters with increasing speed.

Almost all modern code training tapes and programs use a technique known as the Farnsworth Method. This system teaches you to hear the individual characters at a fairly high rate of speed (usually between 18 and 20 words per minute) but spaces the individual letters out at a lower rate of speed (for example, 5 words per minute for somebody learning code for their Novice license). You may hear Old-timers talking about the "walls" that code students hit at 10 and 18 words per minute. These barriers are overcome by learning code by way of the Farnsworth Method.

Code tapes can be purchased in various increments from as low as 2-1/2 words per minute up through 30 words per minute. Code programs for home computers are infinitely adjustable. Many programs allow you to advance your speed by as little as one tenth of a word per minute. This allows for very smooth transitions to higher and higher speeds. If you own a personal computer, modern code programs offer the best method for mastering Morse code throughout your amateur radio career.

### Where Can I Hear Code?

Once you have learned the letters and numbers, you may want to start copying Morse code off the air. After all, it will save on purchasing additional code tapes. This can be problematic for beginners, however. Not everyone operating in the Morse code mode is necessarily a master of the art. Don't let someone else's bad habits stand in the way of your own success.

One source of accurate Morse code can be found by tuning in to the American Radio Relay League's regular WIAW Code Practice, CW Bulletins and Code proficiency tests on 1.818, 3.5815, 7.0475, 18.0975, 21.0675 and 28.0675 MHz. The Morse code used for these transmissions is machine sent at various speeds to give monitors at all skill levels a source of off the air code practice. Check the current issue of *QST* magazine or contact the ARRL at 225 Main Street, Newington, CT 06111 for further information. They also market a full line of code training tapes and computer programs.

If you have a VHF scanner, you may want to check with local hams to find out if any of your area 2 meter repeater groups offer code practice sessions. While you're at it, check with local hams or at your neighborhood electronics supply stores to find out if any nearby amateur radio clubs are offering license classes. These will usually include excellent code training opportunities.

### Who Are You?

There seem to be two kinds of folks in the amateur radio world. People who love operating in the CW mode and people who love it only slightly more than having their legs run over by a locomotive. There are hams who have been on the air for thirty years and have never hooked a microphone up to their transmitter, preferring to dot and dash away in Morse code. Then there are folks who see learning code simply as a necessary evil if they want to acquire a higher class of license: A skill, once mastered, they never choose to use.

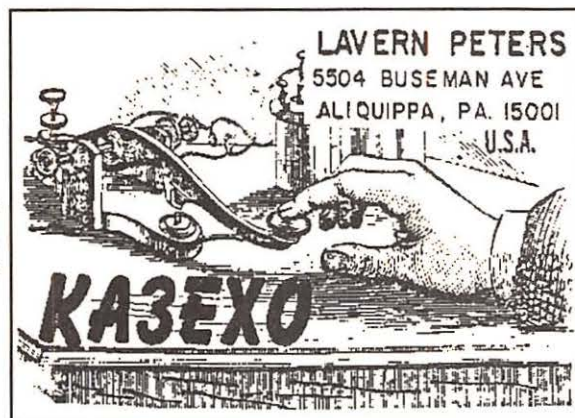
Somewhere along the process of learning to use code, you are likely to discover which camp you belong to. Either way, the learning process is the same. You only need to master two simple concepts to learn Morse code. The only real advantage dedicated code users will have is that they are likely to gain more expertise through more frequent use because...

### Learning Morse Code Requires Practice

Back in my "Martial Arts" period, I asked my Shotokan Ryu Sensei what I needed to do to learn to kick accurately. He told me simply that the only difference between my white belted novice self and him with his forth dan black belt was "several hundred thousand kicks." You see, many learning events in our lives have less to do with IQ than they do with repetition. This is the case with learning Morse Code.

When I took my first Morse code training class at a local ham club many moons ago, the class included both a Ph.D. and a high school

Old Uncle Skip's very first HF amateur radio contact was on CW





drop out. We all went on to pass our novice license code test at the same time. The high school drop out went on to get his Extra Class license (with its 20 word per minute code test) within six months of passing his novice test. "Doc" and I are both still locked into our Advanced Class license rut. The key was practice, practice and more practice.

Some pundits claim that the code can be mastered with only 15 minutes of practice about three days per week. This may be true, but it will probably take years of study. Repetitive training is the key from the get go. Plan to spend no less than 30 minutes per day, every day, if you want to see any advancement in your skills. If you can muster more time, so much the better.

Along with regular practice, there is only one other thing you have to keep in mind.

### Always Go Faster

If there is any "trick" to learning the code, it would be this: keep trying to copy at a higher speed. By the time most people have fully mastered the letters, numbers and punctuation, they are already copying between 5 and 7-1/2 words per minute. This is fast enough to sit for the Novice Class code test. Now, turn up the juice! Copy code at a higher rate of speed. The rule of thumb is: whenever you can accurately understand 70% of what you are listening to, move the speed up a notch. If you wait until you are at 100% copy before increasing the speed, you will find that learning at a higher rate will become more difficult and more discouraging.

Regular practice sessions and providing a constant challenge by increasing the speed is all it takes to learn code from 0 words per minute through 20 words per minute and beyond into the world of high speed code operation.

If you are in the "I can't stand Morse Code" camp, you will need to motivate yourself with the reward of increased ham privileges. Make yourself a behavioral promise or two. Maybe something like, "If I get my General Class ticket I will treat myself to a new transmitter." If your pocket book can't support a new rig after each license test, take things down a notch. Try something like: "I will only participate in the radio hobby one hour for each half hour I practice each week." That means that seven half-hour practice sessions will yield seven full hours of radio monitoring or transmitting (assuming you already have a few ham privileges).

### Poor Penmanship Prevails

Remember how hard your second grade teacher worked to get you to form such perfect letters and numbers? Remember all those stovepipe ovals you drew in order to master beautiful and flowing cursive writing?

Well, save it for your love letters, Compadre! Writing fast is more important than writing stylishly in code work, especially when getting close to 15 plus words-per-minute.

Determine if you write faster using block or cursive lettering; which form of writing offers you the highest economy of movement? For most folks, fast cursive writing will do the trick. Wasted motions such as picking up the pen from paper (three times for some letters) must be eliminated. It don't have to look pretty, Pal. You just have to be able to translate it when it comes time to answer those test questions. One of the greatest boons to high speed writing today is the felt tipped pen. It won't break like a pencil, and it won't skip like a ball point pen. I remain convinced that its inventor was a CW operator.

### Don't Just Sit There, Get on the Air!

Once you have achieved at least the minimum Novice Class access to the HF bands, get on the air and start making CW contacts. As you increase in proficiency, don't be afraid to send "QRQ" to the other station to indicate you want to continue the conversation at a higher rate of speed.

If you really want to get a taste of what it's like to hang in there at high speeds, tune through the bands during a CW contest. You will be amazed at how fast folks will be slinging signals. With a little practice you will also amaze yourself at how fast *you* can make a contest exchange. Often folks find they can operate a contest with its standard and repetitive messages at speeds well in excess of what they can currently copy in plain text.

### The End of an Era?

Morse code is growing increasingly UNpopular in the commercial radio world. Higher speed digital modes are taking the place of the old hand key. However, CW remains a super mode of operation for the radio amateur. Simple home-brew CW transmitters are well within the skill and the pocket book of any dedicated radio hobbyist. CW uses bandwidth and power more efficiently than most communications methods.

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But most importantly, if you want to join your fellow amateurs on the HF bands, you must learn Morse code to get there. So you may as well drop in on the CW frequencies and get in on the fun. Who knows, even you may become a dedicated CW operator while on the way to mastering Morse code for your amateur radio license. See you on the low bands, folks!

**M<sub>T</sub>**





## Emptying The Mail Bag!

As I sat down to write this month's column I heard a little voice. It came from a stack of mail sitting on the corner of my desk. The more I tried to ignore it and get on with my work, the louder it got. So I guess I had better listen to that stack of rustling papers and take this opportunity to empty the ol' mail bag.

### New Mexico Adventure

Todd Dokey sent me this note via the Grove BBS commenting on "Steve and Elwood's's Weird Adventure" that ran in August. Todd says:

"I was amused by your story regarding your trip to New Mexico. You were obviously startled by the all the 'fun' because you never had lived there! I spent a little over a year in the state, and such occurrences area a constant. It's one wierd place.

"You've got the Native Americans, Mexicans and the Spanish cultures all mixing with the military and academics. Then there are the 'new agers' up in Santa Fe worshipping their crystals and bad artwork. Next time you visit, you need to stop at the Owl Bar near the Stallion Gate at the north end of White Sands on Highway 25 (near Socorro) and have a chili cheeseburger.

"Socorro has some very interesting monitoring, but I will leave that for you to discover. I won't discuss it in public! There is a motel in the middle of town. Stay there so you can hear the explosions! Also, take a drive on the New Mexico Tech campus in Socorro. Don't forget to take your scanner and a frequency counter. Just don't get too close to the mountain or the back end of the Workman Center with your scanners. The campus police have direct ties to the FBI, and the government has a few projects on campus that they want to protect.

"I could tell you many stories about New Mexico that would curl your hair. Next time, play it safe and watch out for the illegal aliens, like those who thought you were a cop (because you were toting a scanner). Some of them are packing weapons and run drugs, so it might not be too funny when they think you are the law. Once I was stopped by the Border Patrol while taking a friend back north from Las Cruces. Since I have

a Blazer, they thought I might have drugs or illegals on board. A whole phalanx of guys in camo gear with trucks and M-16s descended on us. Pretty intimidating stuff. Remember, keep your head down and your scanner on!"

Thanks for the recommendations and the advice, Todd!



### Speaking of New Mexico...

Larry Gold from El Paso, Texas, sends us an interesting photo he took of a sign located on US 54 just west of Oro Grande, New Mexico (which is just outside the White Sands Missile Range). Larry says there are also identical signs posted on US 54 south of Carrizozo and on US 70 west of Alamogordo.

### Military Help Wanted

Frank Mason from Reading, MA, writes the Federal File to see if anyone can help him identify some military aircraft he is seeing flying over his home. Frank writes, "Outside my home I used to watch SAC aircraft fly over (recognizable by their contrails). Now I understand that the Navy has taken over. I have noticed for the most part that they fly about the same route and from the usual direction only in tighter formation.

"My home is in North Reading, MA, about 20 miles north of Boston. Most of the aircraft come from the northeast, make a turn and fly right over our home and head west. We also get quite a few aircraft heading towards Europe and Greenland. My question is, do you or your readers have any idea where they might be going or coming from, or the frequencies they operate on?"

Frank, let me try and answer your question by first saying that SAC wasn't taken over by the Navy. At the end of the Cold War, SAC, TAC & MAC were reorganized into Air Combat Command, STRATCOM and Air Mobility Command. The aircraft you are seeing could be heading for the many aerial refueling tracks in your area. Right off the coast near you is AR-608, to the northeast is AR-616 A&B and to the northwest is AR-631. The frequencies for the tracks are (all freq MHz :

AR608: 343.500 (primary)  
282.700 (secondary)  
AR-616 A&B: 283.900 (primary)  
282.700 (secondary)  
AR-631: 295.800 (primary)  
282.700 (secondary).

Bases in your area include Westover (AFRES), Hanscom, (AFSC), Griffiss (STRATCOM), Plattsburgh (STRATCOM), Loring (STRATCOM), and McGuire (AMC). A good frequency guide listing the bases in your area and their frequencies is the *Directory of North American Aviation Communications*, published by Hunterdon Aero Publishers, P.O. Box 754, Flemington, New Jersey 08822.

In the meantime, keep the following frequencies programmed into your scanner (all freq MHz:

311.000 STRATCOM primary  
321.000 STRATCOM secondary  
255.400 military to FAA FSS  
254.700 experimental test Hanscom  
257.800 General Edward Lawrence Logan  
263.100 Int'l Airport  
279.100 "  
279.600 "

If there any other military monitors out near Boston that can give Frank a hand, send your frequency lists to Frank, in care of the Federal File.

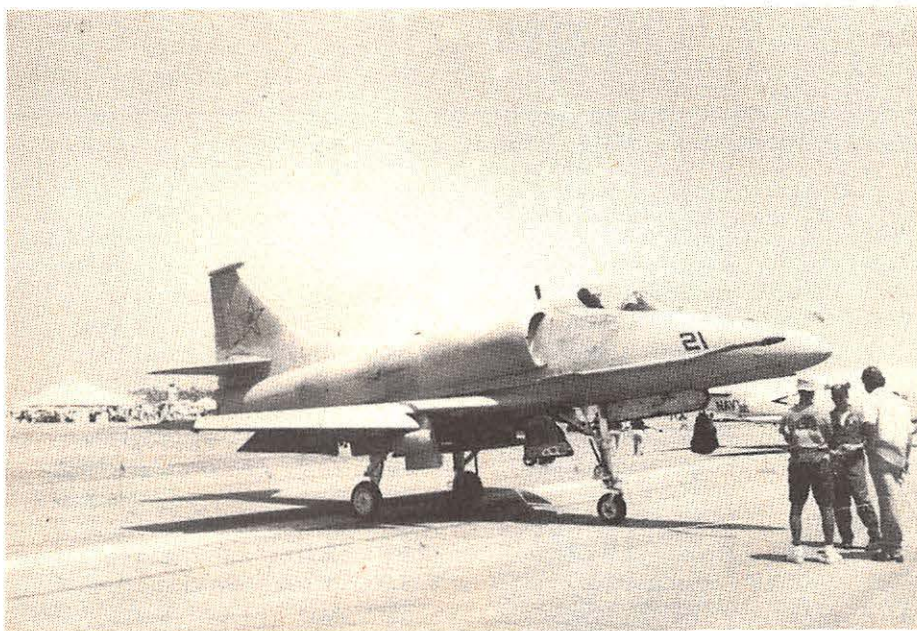
### Dutch Stealths

From the Netherlands, J. Verweg writes us about a visit from Holloman AFB, and their F-117s. It seems that eight F-117As from Holloman were posted to Gilze-Rijen Airbase during exercise "Control Enterprise." The F-117s used the callsign "CLAN" (CLAN 51-54



## Gilze-Rijen Air Base Frequencies (Royal Netherlands Air Force)

Freq MHz	Description
119.700	Regional Guard (all services)
122.100	NATO tower Guard
123.300	NATO GCA (final talkdown)
244.900	Final 2
257.800	NATO tower frequency
260.050	Dutch Mil Info
284.850	Dutch Mil RAPCON
290.475	Approach
317.500	NATO fixer Guard (DF)
336.450	Ground Control
341.700	Final 1
344.000	NATO GCA UHF (or final talkdown)
344.8250	Director
362.300	NATO approach
368.1750	Monitor MTMA-D
369.600	Tower primary
385.400	NATO final
446.120	General & emergencies
446.360	Fire Dept.
446.000	USAF Ops. ground services (only during USAF deployments)
446.900	USAF Ops ground services (only during USAF deployments)



and CLAN 61-64). Along with the report, J. sends us his frequency list (Table 1) for Gilze-Rijen Airbase.

### In the Blind?

Someone sent me an anonymous note with this question, "I have heard the phrase 'In the Blind' many times. Do you know what that refers to?"

Your Federal File editor thinks it means to transmit a message without knowing if it is being received or not. For example, a station could be transmitting without being able to hear the party to whom the message is intended. Any other guesses or answers out there?

### Big Red's Big Pictures

From California and "Big Red" (a frequent contributor) come some excellent photos he took at the 1993 El Toro MCAS Air Show. One of the best is displayed here. It is of an A-4F Mongoose (stripped Skyhawk) of VFC-13 *Fighting Saints* from NAS Miramar, a Reserve Adversary squadron recently assigned to CVWR-30; hence the stylized "ND" (wing letters) in the middle of the Russian Star. Just goes to show that the Russians are still playing the roll of bad guys. Thanks, Red.

Well, that's all the room we have this month. Keep those cards and letters coming in. The Federal File needs and welcomes your input.

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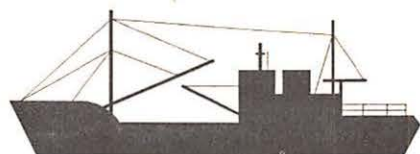
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## Ship Weather Observations Part 2

In the September column we explored how to decode the weather observations reported by ships on the high seas. Now, as promised, we provide some frequencies where these messages are likely to be heard. Table 1 is a list of such frequencies on upper sideband voice channels.

Table 2 is a list of CW frequencies, which is a likely place to find OBS (ships' observation) messages. This should give you some good chances to not only hear the ship weather observations, but also to practice your Morse code - or exercise your Morse reader!

Since this is the last column until the new year, I wish you all a very Merry Christmas, Happy Channukah, and all the very best for 1994. In January I will dip into the mail bag as well as look at some VHF and HF maritime frequencies to try.

M  
T

**Table 1: Voice Frequencies, MHz, Upper Sideband**

2.5140	VCS	Halifax CG Radio	8.7370	VAI	Vancouver CG Radio	17.2510	VIP	Perth Radio
2.5720	WLO	Mobile Marine Radio	8.7490	VIP	Perth Radio	17.2600	WLO	Mobile Marine Radio
2.5820	VCS	Halifax CG Radio	8.7610	VIP	Perth Radio	17.2630	VAI	Vancouver CG Radio
2.9580	VCS	Halifax CG Radio	8.7640	GKU46	Portishead Radio	17.2690	VIS	Sydney Radio
4.1250	VIP	Perth Radio	8.7730	GKU49	Portishead Radio	17.2720	GKU61	Portishead Radio
4.1250	VIS	Sydney Radio	8.7820	GKV42	Portishead Radio	17.2840	GKU65	Portishead Radio
4.1460	VIP	Perth Radio	8.7850	VCS	Halifax CG Radio	17.2930	GKU68	Portishead Radio
4.1460	VIS	Sydney Radio	8.7880	WLO	Mobile Marine Radio	17.3080	GKV63	Portishead Radio
4.3600	GKT 22	Portishead Radio	8.7940	GKV46	Portishead Radio	17.3090	VIS	Sydney Radio
4.3660	VIP	Perth Radio	8.7844	PCG 41	Scheveningen Radio	17.3350	WLO	Mobile Marine Radio
4.3690	VIS	Sydney Radio	8.8030	VIS	Sydney Radio	17.3470	PCG 61	Scheveningen Radio
4.3690	WLO	Mobile Marine Radio	8.8030	WLO	Mobile Marine Radio	17.3500	GKW 67	Portishead Radio
4.3720	GKT 22	Portishead Radio	8.8060	WLO	Mobile Marine Radio	17.3500	GKW 62	Portishead Radio
4.3840	GKT 20	Portishead Radio	8.8090	GKW 41	Portishead Radio	17.3590	GKW 60	Portishead Radio
4.3840	VAI	Vancouver CG Radio	13.0770	GKT 51	Portishead Radio	17.3620	WLO	Mobile Marine Radio
4.3960	WLO	Mobile Marine Radio	13.0880	GKT 52	Portishead Radio	17.5270	GKT 66	Portishead Radio
4.3990	VIP	Perth Radio	13.0830	VIS	Sydney Radio	19.7550	GKT 18	Portishead Radio
4.4050	VIS	Sydney Radio	13.0920	GKT 56	Portishead Radio	19.7610	GKU 18	Portishead Radio
4.4080	VCS	Halifax CG Radio	13.0950	VAI	Vancouver CG Radio	22.7020	VIS	Sydney Radio
4.4110	WLO	Mobile Marine Radio	13.1100	WLO	Mobile Marine Radio	22.7080	PCG 71	Scheveningen Radio
4.4260	VIP	Perth Radio	13.1130	PCG 51	Scheveningen Radio	22.7110	GKT 76	Portishead Radio
4.4260	VIS	Sydney Radio	13.1130	VCS	Halifax CG Radio	22.7290	GKU 72	Portishead Radio
4.4320	GKV 26	Portishead Radio	13.1460	GKV 54	Portishead Radio	22.7290	VIP	Perth Radio
6.2150	VIP	Perth Radio	13.1490	WLO	Mobile Marine Radio	22.7350	GKU 74	Portishead Radio
6.2150	VIS	Sydney Radio	13.1520	VIP	Perth Radio	22.7530	GKU 70	Portishead Radio
6.2270	VIP	Perth Radio	13.1520	WLO	Mobile Marine Radio	22.7530	VAI	Vancouver CG Radio
6.5070	VIP	Perth Radio	13.1580	GKV 58	Portishead Radio	22.7620	VIS	Sydney Radio
6.5070	VIS	Sydney Radio	13.1610	VIP	Perth Radio	22.7740	WLO	Mobile Marine Radio
6.5130	VAI	Vancouver CG Radio	13.1640	GKV 50	Portishead Radio	22.7800	GKV 79	Portishead Radio
6.5180	VCS	Halifax CG Radio	13.1670	VIS	Sydney Radio	22.7860	WLO	Mobile Marine Radio
8.2940	VIS	Sydney Radio	13.1700	GKW 52	Portishead Radio	22.8040	WLO	Mobile Marine Radio
8.7220	GKT 42	Portishead Radio	17.2450	GKT 62	Portishead Radio	22.8130	GKX 70	Portishead Radio
8.7220	VIS	Sydney Radio	17.2450	VIS	Sydney Radio	26.1480	GKU 25	Portishead Radio
8.7340	VIP	Perth Radio	17.2510	VCS	Halifax CG Radio			



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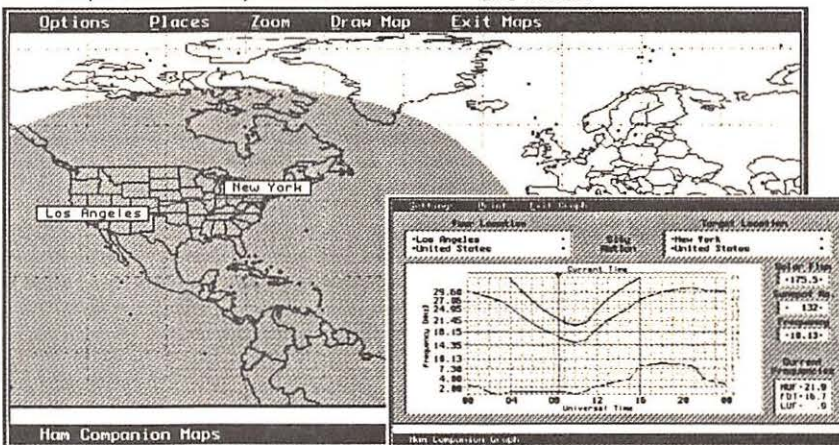
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Table 2: CW Frequencies, MHz

2.0555	WLO	Mobile Marine Radio	8.5840	WLO	Mobile Marine Radio	13.0249	WLO	Mobile Marine Radio
4.2450	VIS	Sydney Radio	8.5458	GKA 4	Portishead Radio	16.9025	PCH 60	Scheveningen Radio
4.2500	PCH 20	Scheveningen Radio	8.5520	GKK 4	Portishead Radio	16.9188	GKJ 6	Portishead Radio
4.2515	GKD 2	Portishead Radio	8.5620	PCH 40	Scheveningen Radio	16.9485	VCS	Halifax CG Radio
4.2560	GKD 2	Portishead Radio	8.5690	GKD 4	Portishead Radio	16.9544	GKC 6	Portishead Radio
4.2575	WLO	Mobile Marine Radio	8.5816	GKM 4	Portishead Radio	16.9685	WLO	Mobile Marine Radio
4.2679	GKG 2	Portishead Radio	8.5915	GKG 4	Portishead Radio	16.9746	GKD 6	Portishead Radio
4.2725	VID	Darwin Radio	8.5970	VIP	Perth Radio	16.9976	WLO	Mobile Marine Radio
4.2740	GKB 2	Portishead Radio	8.6040	GKH 4	Portishead Radio	17.0072	PCH 61	Scheveningen Radio
4.2850	VCS	Halifax CG Radio	8.6060	GKI 4	Portishead Radio	17.0216	WLO	Mobile Marine Radio
4.2860	GKA 2	Portishead Radio	8.6220	PCH 41	Scheveningen Radio	17.0920	GKH 6	Portishead Radio
4.3145	GKH 2	Portishead Radio	8.6580	WLO	Mobile Marine Radio	17.0984	GKA 6	Portishead Radio
4.3160	GKM 2	Portishead Radio	8.6840	GKJ 4	Portishead Radio	17.1130	GKB 6	Portishead Radio
4.3175	GKI 2	Portishead Radio	12.6600	WLO	Mobile Marine Radio	17.1368	GKM 6	Portishead Radio
4.3180	VIT	Townsville Radio	12.7045	WLO	Mobile Marine Radio	17.1512	GKI 6	Portishead Radio
4.3230	VIP	Perth Radio	12.7140	GKM 5	Portishead Radio	17.1675	GKK 6	Portishead Radio
4.3265	GKJ 2	Portishead Radio	12.7885	GKD 5	Portishead Radio	17.1720	GKG 6	Portishead Radio
4.3360	GKK 2	Portishead Radio	12.7908	GKG 5	Portishead Radio	17.1724	WLO	Mobile Marine Radio
4.3430	WLO	Mobile Marine Radio	12.7915	GKH 5	Portishead Radio	22.3245	PCH 70	Scheveningen Radio
4.4625	WLO	Mobile Marine Radio	12.7995	PCH 51	Scheveningen Radio	22.3685	VAI	Vancouver CG Radio
6.3440	WLO	Mobile Marine Radio	12.8158	GKF 5	Portishead Radio	22.4073	GKC 7	Portishead Radio
6.4160	WLO	Mobile Marine Radio	12.8220	GKA 5	Portishead Radio	22.4320	GKD 7	Portishead Radio
6.4465	WLO	Mobile Marine Radio	12.8354	GKB 5	Portishead Radio	22.4487	GKB 7	Portishead Radio
6.4640	VIS	Sydney Radio	12.8535	PCH 52	Scheveningen Radio	22.4670	GKA 7	Portishead Radio
6.4915	VCS	Halifax CG Radio	12.8580	GKI 5	Portishead Radio	22.4940	GKK 7	Portishead Radio
8.4400	VCS	Halifax CG Radio	12.8715	GKJ 5	Portishead Radio	22.5030	GKG 7	Portishead Radio
8.4455	WLO	Mobile Marine Radio	12.8740	VCS	Halifax CG Radio	22.5255	GKH 7	Portishead Radio
8.4520	VIS	Townsville Radio	12.8865	WLO	Mobile Marine Radio	22.5270	GKM 7	Portishead Radio
8.4735	WLO	Mobile Marine Radio	12.9521	VIS	Sydney Radio	22.5285	GKI 7	Portishead Radio
8.4870	VID	Darwin Radio	12.9920	WLO	Mobile Marine Radio	22.5390	PCH 71	Scheveningen Radio
8.5140	WLO	Mobile Marine Radio	12.9940	VIP	Perth Radio	22.5450	GKJ 7	Portishead Radio
8.5160	GKC 4	Portishead Radio	13.0065	GKK 5	Portishead Radio	22.8195	VCS	Halifax CG Radio
8.5210	VIS	Sydney Radio	13.0198	GKC 5	Portishead Radio			



# Soup Up Your Loop

As a general rule, *Below 500 kHz* is not a construction project column. I like to keep things on the lighter side and concentrate on the fun of monitoring and DXing longwave signals. Occasionally though, something special comes along that is easy to build and dramatically improves LF reception.

The Homespun Loop (September 1992) was one example. Many readers built this simple antenna and started hearing signals they never knew existed. (I'm still getting requests for reprints, and will be glad to send you a copy for an SASE.) This month I've described a circuit that you can use along with any LF loop to pull in even more signals.

Loop antennas are tough to beat for the low frequencies because of their directivity and compact size. However, without amplification they can lack sensitivity to weaker signals. For some time now, I've been searching for a very simple circuit that would boost the performance of a loop to allow for even better DXing. The arrangement shown in Figure 1 is one result of my experimenting. It is an adaptation of a similar circuit presented a few years ago by Clem Small, KR6A, for use as in active antenna.

Even if you've never attempted an electronic project before, this would be a great way to begin. After all, there are no PC boards to etch, no coils to wind, and everything you need for the project can be obtained at your local Radio Shack (see Table 1).

## Construction

Follow the steps below to assemble the preamp. The physical layout is not at all critical. You should try, however, to use the exact values I've listed in Table 1.

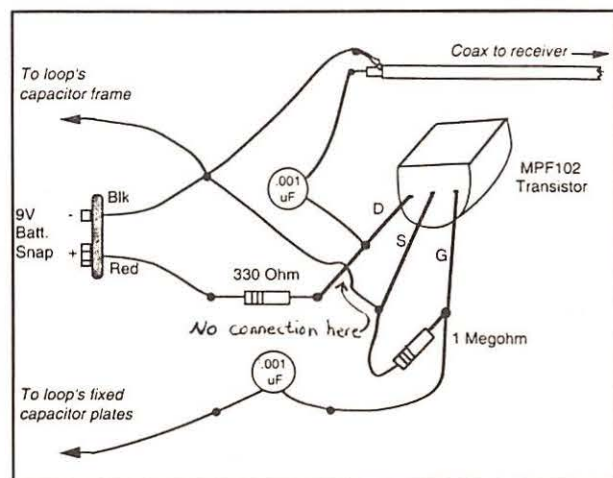


Figure 1: Wiring diagram for loop amplifier

1) Cut a 1 X 1-1/2 inch piece of experimenter's perf board from a larger sheet. (Tin snips work well for this purpose.) Drill a small hole near one end of the board—this will later be used to mount the board.

2) Insert the component leads through the board and make the solder connections shown in Fig. 1.  
3) Connect the two input wires to the loop's tuning capacitor as indicated on the drawing. These wires should be kept fairly short (3-4 inches is acceptable).

4) Use a small wood screw to attach the perf board to the loop frame near the tuning capacitor.  
5) Mount the 9V battery holder at a convenient spot just below the perf board.

6) Finally, install a 9V battery and hook up the shielded output cable to your receiver's Ext. Ant. jack. (You can secure the cable to the loop frame with a tie wrap if you wish.)

**NOTE:** If you're using the preamp with the Homespun Loop, the antenna's previously used coax cable (the one that connects to the pickup winding) can be coiled up and secured with a rubber band for now.

## Checkout and Operation

When I hooked this circuit up to my loop, I could hardly believe my ears. Beacons that had previously been barely readable were now pounding in at 3/4 scale. It made my Sangean portable sound like a new radio. When I made more precise measurements using my Drake R8, I observed approximately 30 dB of gain over the non-amplified loop.

To test the preamp, tune to a known beacon signal and carefully adjust the tuning capacitor for resonance. You should notice a sharp increase in signal strength. You'll probably notice that tuning is even sharper than it was for the unamplified loop. If you want to do a comparison, disconnect the preamp and briefly re-connect the loop's old coax (the one connecting to the pickup winding) to the receiver. Signals should be much lower without the preamp.

With this comparison out of the way, you may want to remove the pickup loop entirely (and its coax) from the wooden frame and discard it. On my test antenna, doing this seemed to improve overall operation.

One convenience you may want to add to the preamp is a

Table 1: Parts Checklist

Part Description	Radio Shack P/N
MPF102 FET Transistor	276-2062
1 Megohm Resistor	271-059
330 Ohm Resistor	271-017
Two .001 mF Disk Capacitors	272-126
9V Battery Holder	270-326
9V Battery Snap Connector	270-325
Approx. 6 Feet/RG-58 coax	278-1314
Small perf board	276-1395

small toggle switch in series with the battery's positive lead to turn it on and off. This way, you won't have to keep unsnapping the battery plug each time you use the loop.

## In Summary

Clearly, there are more elaborate preamp designs out there. However, the objective here was to come up with a workable design that could be built quickly and with a minimum of parts. If you build one, I'd appreciate hearing how it works for you. Just drop me a line c/o *Monitoring Times*.

## News and Notes

While looking through a Sporty's® pilot catalog recently, I spotted a book that may be of interest to beacon chasers and AM broadcast DXers alike. It's called the *ADF Directory and Manual* (item# M716A) and it lists most North American beacons and AM broadcast stations as an aid for radio navigation. The unique thing about this guide is that the stations are listed by state. This could be helpful if you are trying to find beacons in a specific area.

The catalog also lists various flight maps and the *Airport Facility Directory*, both of which show the locations and frequencies of beacons. To place an order for any catalog item you can call Sporty's® at 1-800-LIFTOFF.

If natural radio is your thing, you should know about the *INSPIRE Journal*. This publication deals with VLF phenomena (whistlers, dawn chorus, spherics, etc.) It focuses on a nationwide monitoring project attempting to study the causes and effects of these naturally occurring signals. For more information on the INSPIRE Project, or the *Journal*, write to Bill Pine, Chaffey High School, Ontario, CA 91762. Be sure to enclose an SASE.

I'll see you next month!

*M<sub>T</sub>*



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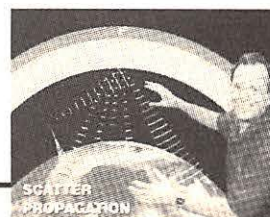


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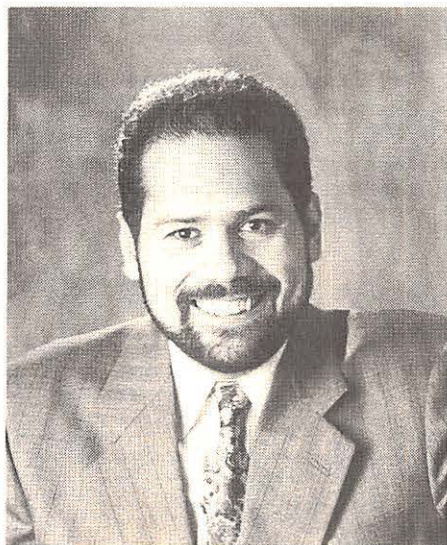


## The Talk Of the Nation

Can a mild-mannered reporter from Brooklyn bring new intellect and innovation to talk radio from coast to coast? Can anyone grab the attention of millions of Americans accustomed to the monotonous din of call-in shows? Yes! Ray Suarez already has on National Public Radio's *Talk of the Nation*.

For two hours, from 2 to 4 pm Eastern time, Monday through Thursday, Ray becomes master of ceremonies of a different kind of talk show. "Our central mission is to demystify the news business and to make radio a two-way medium. Our work is opened up to the public, and they become the co-interviewers or, sometimes, the co-guest!" *Talk of the Nation* is a wonderful place to exercise your mind. With well-chosen guests and a delightful potpourri of topics, Ray's show seeks "anyone who wants to listen to an interesting conversation." Consider it a candy store for your mind!

*Talk of the Nation* is not a show that heralds a specific political stance or continuing point of view. The people who call in often gain as much influence over the show as the host and his guests. Ray is the leader of the program, but he also serves as a thoughtful and skilled arbitrator between the conversants. The topics addressed are limited only by the imaginations of Ray and his staff. "It gives us a chance to do some really interesting shows. If we make it interesting, we can do a show on it." Few broadcasters are allowed such freedom!



Eric Futran

Ray Suarez, host of *Talk of the Nation*.

For the past twenty years, Ray Suarez has been preparing for this culmination of his career. It has not been easy, even though Ray had already decided journalism was his life's work by the time he graduated from John Dewey High School in Brooklyn. Ray carefully searched for a college where he could hone his skills, and matriculated into New York University in Manhattan. Both NYU's daily newspaper and radio station gained an enthusiastic and gifted staff member. Ray also served as a newsroom desk assistant at WNEW and ABC Radio.

Upon graduation, full-time employment was hard to secure. NBC's News and Information Service had recently failed, and the area was filled with journalists desperate for work. Without much experience, Ray was forced to look elsewhere.

For a time, Suarez became a writer for a trade publication that served the North American pulp and paper industry. Ray outgrew this challenge rapidly. "I took a chance and sold all my furniture and all my books. I saved all my money, married my girlfriend, and moved to London, figuring I could probably make a living as a free-lance, and it worked!" Ray quickly established himself as a fast, reliable, and efficient correspondent.

Later, following the action attracted him to Italy, where he free-lanced for CBS' Rome bureau. "That was a good time, too. I made a lot of money, and I learned a lot, and was an accredited member of The Vatican Press Corps. It was very exciting, and very heady stuff for someone who was 25."

Ray enjoyed his devil-may-care lifestyle, but eventually found himself in search of a more stable position stateside. He could be secure making a living in Rome, but did not foresee ever being promoted. Once again, he called ABC Radio, and was hired on the spot as a news writer and editor. These were the rewards of years of sacrifice and experience, he felt. Surely his courage and ability had earned him a fine reputation as a reporter, and made him a welcome addition to ABC's permanent staff.

The sense of accomplishment was short-lived. Two weeks after being hired, a friend revealed to him that his rapid employment was not based on his skills, but on his ethnic background. A class-action suit had recently been won by a group of ABC's black and hispanic employees who claimed discrimination in hiring and promotions. They won their case, but Ray lost his pride.

"That was a growing up day, because I realized the business was a lot more complicated and it wasn't a meritocracy. That was pretty depress-

ing. [The job] was personally useful, but professionally less than satisfying."

In 1985, Ray advanced his career once more, becoming a correspondent for Cable News Network in Los Angeles. After a year's service, he became a street reporter for NBC's WMAQ-TV in Chicago. For seven years, he pounded the pavement in The Windy City, establishing himself as a well-known personality on Channel 5. His confidence restored, Ray enjoyed the compliments he received when recognized during his commutes on Chicago's subways. Life was good, but the pace was hectic!

"The day would start when the baby would wake up at 5:30, and you'd go through the motions, and then run in to work. My work day was long and stressful and crazy, then I'd take the subway home. I'd walk through the door and start with the baths and feeding and changing. And by the time we ate and I'd finally get to bed, I would fall asleep immediately because I was whipped! And then the alarm clock would go off again, or the baby would get up again!" He looked and felt awful, but he knew that for a few months this stage could be endured.

Now at age 35, Ray again saw himself in a job with no future. "The NBC philosophy is 'only the anchors matter.' They believe if you create a strong identifiable anchor presence, it doesn't matter who the reporters are. Not only do I not agree with that, I think it's foolish beyond measure, because your only contact with the public is through your reporters. I knew no matter how good I was, there was no point in hanging around anymore."

Ray applied for, and received, The William Benton Fellowship in Broadcast Journalism offered by The University of Chicago. The award granted him a year off with pay to study at the university with other mid-career journalists, "and it was just wonderful," Ray recalls. A man of diverse interests and passions, Ray used his time studying urban geography and urban economics: the problems and process of urban life. He earned a master's degree in Social Sciences, augmenting his bachelor's degree from NYU in African History.

Unknown to him, his fellowship was a precursor to his current position at National Public Radio. Two other recipients of the Benton Fellowship that year already worked for NPR and independently suggested Ray as a replacement for John Hockenberry who was ending his tenure as host of *Talk of the Nation*.

Initially, Ray felt he couldn't afford to become the host. As attractive as the opportunity



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seemed, Ray was already earning a handsome salary even though it hadn't much future. However, believing that increased public exposure could only help, Ray agreed to be interviewed for the job. NPR, on the other hand, spent month after month looking for a replacement who had already been a talk show host on a public radio station. Many candidates were invited to demonstrate their skills on the air for two or three days apiece. The auditions produced no outstanding champions, until Ray got his chance to shine this past March.

NPR felt they took a big chance when they hired Ray. "A lot of the stations that carry the program were upset and started to ask 'How can you hire a guy who doesn't even do a talk show?'" Ray felt pressure to succeed, as well. "I was brought in to push this show over the hump, because in October of 1993 all the stations had to begin paying for it." The first two years of the show were underwritten by a grant provided by The Corporation for Public Broadcasting. "If I can keep it a success, even after it costs money, and make it even a bigger one and pick up more stations, I'll have done what they hired me for and I'll also have a lot going for me personally."

*Talk of the Nation* is already an unqualified success in the Pacific Northwest and in the San Francisco Bay Area. NPR affiliates in Boston, St. Louis, and Miami have recently added the show, an early testament to Ray's ability in building audiences.

His new celebrity status has brought swift benefits. Suarez has already appeared as a guest speaker on C-Span, and regularly receives attractive offers to lecture across the country, all due to his exposure on NPR. Regular listeners have embraced the program, and supported it with their phone calls and mail. "I get really thoughtful letters from people who are really paying attention."

*Talk of the Nation* is now heard on about one third of National Public Radio's affiliates, 133 stations nationwide. On Fridays, the show is devoted to the world of science and is hosted by science journalist Ira Flatow from the studios of WNYC in New York City. Why is Ray Suarez becoming the talk of the nation? Join the over one million people who tune in each week and find out!

## Bits 'N' Pieces

If you enjoy listening to National Public Radio, you'll enjoy reading *NPR - The Cast of Characters* by Mary Collins. Available in most bookstores, this 150 page volume includes biographical essays of many of your favorite National Public Radio personalities, and a delightful col-

lection of pictures to augment the revealing text. It's published by Seven Locks Press in Washington D.C. (800-354-5348)

## Mailbag

Our July '93 "Simply The Best" column inspired an educational response. Edward Hanlon, of Bolton, Connecticut, insists his home-brew FM antennas are superior to commercial models: "Calling the Channel Master Stereo Probe 9 'The ultimate FM antenna' is not even close! It is the best of a poor lot of commercially available FM antennas. Even the major manufacturers will tell you that there's just not a big enough market to justify a more costly model. I have here, much to my wife's chagrin, every commercially made FM antenna on the market. The Channel Master is the best, but it's hardly awe inspiring for the DXer. What this antenna does much better than most is maintain a good low SWR across the entire band."

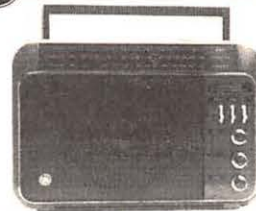
"My response to the dearth of quality FM performers, was to build my own log-Yagi antenna." Edward creates his superior designs with the aid of a computer, then fine tunes them through experimentation. "I concentrate more on front-to-back ratios because it has more impact on DXing. Granted, these antennas are longer than the Probe 9's modest 138 inch boom length, but we're fringe lunatics, aren't we? The best part is that one can open their copy of the ARRL *Antenna Handbook* and design a superb performer fairly easily. Stop settling for mediocrity and build your own! The performance difference isn't subtle!"

## International Bandscan

The U.S. Armed Forces Network in Germany is celebrating its 50th anniversary this year, and listeners all over Europe still enjoy the variety of American music, news and culture it provides. Even opponents to the American presence in Germany are loyal to the station. When the U.S. began to dissolve their operations and begin to send troops home in 1990, Joshka Fischer, a leading member of the anti-NATO Greens Party, commented "They can pull out all of the Americans as long as they leave AFN." When visiting Europe, look for AFN on 87.3 kHz broadcasting with a powerful 150 kW signal.

Finally, give us inspiration! We'd love to hear what you would enjoy reading about, so think of us as Santa and send us all your wishes! Until next month, Happy Thanksgiving and happy trails!

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MT



# European Ku Band Viewing

Monitoring Times reader John Locker from Merseyside, England, sent a number of interesting comments and photographs. Unlike our situation in the U.S., Europe primarily uses satellites transmitting in the Ku band for their domestic consumption. Satellites of interest to hobbyists in Europe range from Intelsat 505 at 66.0 degrees East to TDRS 3 at 62 degrees West. In between those two lie 47 satellites featuring a total transponder capacity of 657 on C and 298 on Ku band.

Besides the usual computer bulletin boards, European satellite watchers have a number of sources for information about their hobby. Roger Bunney writes a column called "Satellite TV News" for *Short Wave Magazine* in addition to regular pieces for *What Satellite TV*. Probably the best source for Euro-Sat watching is a publication called *Transponder*. Published bi-weekly and edited by David Thorpe, *Transponder* crams its 8-1/2 x 11 inch pages with programming tidbits and industry insights.

Watching raw news feeds from SNG (satellite news gathering) field set-ups can provide more dramatic news coverage than what newscast viewers get. John Locker explains it:

"...when watching these packages coming out of Serbia or Somalia we should remember the reporters and cameramen who bring the pictures to us...A few months ago I recall seeing a live feed coming out of one of the small villages setting up a rescue/evacuation of injured civilians. They were talking to an AWACS on their UHF radio asking for top cover as the helicopter came in. Just as she lifted, a mortar slammed into the hillside about 800 yds away...then the second shell punched a hole in the playing field where the chopper had stood a few seconds before. Troops and camera crew threw themselves to the ground as shrapnel cut through the air.

"What appears to have happened is the Serbians had locked their artillery onto the radio

transmissions of the Canadian troops. The first shot was a range finder; the second could have been catastrophic!

"As it was, one of the crew was slightly injured but continued running, camera still live, on his shoulder. Two of the Canadians were badly hurt but managed to scramble to a nearby building where a medic tried to patch them up ... On the news that night what did we see? ... About 20 seconds of video with a voice-over which said that a helicopter had successfully airlifted a number of people from the village ... mortars had landed nearby! ... What an understatement!"

John sent along a number of photos which may give many of us our only opportunity to see some of these transmissions. John says "...more and more domestic TV companies here are using mobile satellite units for O.B. (out bound) work. The dish systems are getting smaller — hence my ability to receive good quality pictures using just a 90 cm dish..." I believe the quality of his photos speak to his success. If you'd like to contact John directly via packet radio his packet address is G-7 miz @ GB7OAR.GBR.

## MAILBAG

### FM Subcarriers On Cable

After reading in the August column about the many international broadcasters which transmit their signals on the "cable birds," Dave Ivarson, W3WBE, of Collegeville, PA, called his local cable company. He writes: "...they did not know what I was talking about. I also contacted C-SPAN and they advised that the audio service is not available in my area..." Dave wants to know how the cable systems receive and then retransmit these audio signals to subscribers.

Dave, most cable systems treat audio services like a bad habit. They'd like to get rid of it altogether. There are, of course, exceptions. I've heard from readers on various systems around the country whose cable companies offer a wide range of non-video services from CD quality commercial-free audio services to computer based text services.

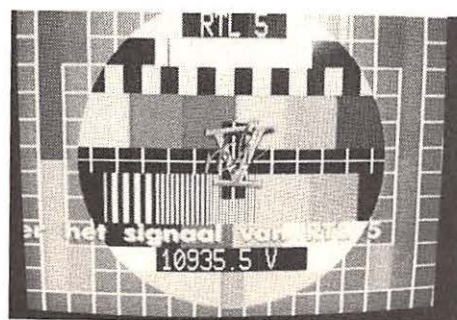
Basically, a local cable company has several dishes in its dish farm from which it receives the various audio or video programming it offers. The signals from these dishes are fed into multiple power-passive splitters. Each splitter output is assigned to a different receiver. The output of the receiver is fed directly to a modulator which is essentially a low power transmitter designed to transmit on a specific frequency, just like the channel 3 modulator in your VCR. The signals from all the modulators are brought together in a "combiner" which sends all the frequencies along the coax, which is then split and boosted until it finds its way to your home.

As you can see from the above description, to make such audio programming available to the cable subscriber requires a certain amount of investment on the part of the cable operator. For all this trouble they charge anywhere from a dollar to five dollars a month, for a service in which only a small minority of subscribers seem to be interested.

A full treatment of the technical aspects of cable and SMATV (Satellite Master Antenna Television) installations can be found in Frank Baylin and Steve Berkoff's *Wireless Cable and SMATV* published by Baylin Publications. This 386 page 8-1/2 x 11" book will answer every conceivable question on the subject. It is available for \$50 plus shipping from Baylin Publications, 1905 Mariposa, Boulder, CO 80302 or call 303-449-4551 or FAX 303-939-8720.



WTN World Television News billboard from Eutelsat II-F1 (13 Degrees East).



John Locker caught this new German cable TV station on Astra 1C. He writes: "Notice freq. 10935 vertical. Below normal 10950 limit but can be locked up by adjusting LNB offset to -15 MHz!"



A Satellite News Gathering (SNG) field unit shows itself off on Eutelsat II-F4 (7 degrees East)



## Cheap Fun With Your Dish

In response to a question from LaVaughn Mullenback of Brownsdale, MN, I described a simple system for receiving SCPC radio signals from her dish for \$30. She writes back: "...my husband took me into Radio Shack and I was able to get the [TV band] radio and the necessary accessories [a VHF splitter and two short lengths of RG/58 cable with F connectors attached] to hook up the SCPC audio. This morning I followed your instructions ...

Take the output of the secondary IF loop on the back of your satellite receiver and feed it into the VHF splitter; take one leg of the splitter and feed it, with a length of RG/58 with the F connectors, back into the input of the IF loop; take the other piece of cable and insert one end into the other leg of the splitter and to the other end attach a 300 ohm to 75 ohm balun; to the 300 ohm wires out of the balun attach a plastic antenna "clothes pin"; clip the clothes pin onto the TV band radio's antenna; set the radio to the band which corresponds to the frequency of the IF loop, i.e. 70 MHz or 130 MHz, and turn the audio up a little; set your satellite dish to Galaxy 4 transponder 3 and start tuning the radio; every half inch or so along the dial you should hear some very familiar radio networks.

...and 'whadaya know!' It worked. I found Minnesota Public Radio and other public stations, WSCB, Buffalo; KDKA, Pittsburgh, and For the People Network. The signals did fade, but there they were...The quality of reception for SCPC on the (TV band) radio is not real good, but I am taking into consideration the quality of the radio. It was worth the \$30 investment just to discover what can be accomplished with knowledgeable information and the right accessories..."

LaVaughn also wanted to know how to receive analog FM subcarriers below the 5 MHz range of her receiver.

LaVaughn, welcome to the interesting world of satellite TV DX. Once you start down the road you'll not be satisfied until you can receive it all, and in stereo! The proper way to do SCPC is with an SCPC receiver which utilizes the block downconversion method of reception. Typically, these receivers will cost around \$400. And, yes, if you want stereo SCPC you'll have to get two of them.

As to receiving the analog subcarriers below 5 MHz, it is indeed possible. What is needed is an up-converter for the audio which receives the subcarrier and converts the frequency up to the area where it can be received on your satellite receiver. United Satellite Systems sells these "translators" with the SSP1A stereo processor for \$150 plus shipping. Regardless of your cur-

rent receiver's capability, the USS unit will sound better. The "translator" is plugged in-between the baseband output of your satellite receiver and the SSP1A stereo processor. Write USS, Highway #1 West, Thief River Falls, MN 56701-0351 or call 218-681-5616 for more.

## Keeping A Weather Eye Out

Bill Perrelli of Hamden, CT, is "...an avid weather satellite person..." He writes, "I am very interested in upgrading to the GOES, METEOSAT satellites. My present Vanguard receiver will support the downconversion." His problem is that his family believes he has enough antennas up already! (A familiar problem!) He would like to know if a 44 element Yagi would work and where to buy a used 1691 downconverter, Yagi or a small 3-4 foot dish.

Well, Bill, I went directly to the top expert in the field — *The Weather Satellite Handbook* by Dr. Ralph E. Taggart, WB8DQT. For GOES/METEOSAT reception a dish is the optimum way to go. A four foot, or 1.2 meter dish will typically have 24 dBi gain, which is plenty for the task at hand. Best of all, these are relatively small and, unlike their 10 foot brothers, easily tucked away so as to be less obtrusive. Since the dish will not need to be motorized, a nice AZ/EL fixed mount can be made quite inexpensively. These little dishes, once set up and properly aimed, can be surrounded by short privacy fences or clever shrub arrangements while maintaining an opening toward the satellite. In chapter 2 of Dr. Taggart's book you'll learn how to make your own S band feedhorn using a 2 pound coffee can, and subsequent chapters deal with preamps and downconverters. The book is an absolute "must" for any serious weather satellite enthusiast.

Finding a source of preamp downconverters for 1691 is less encouraging. I've searched my esoteric and surplus electronics catalog file and have come up empty. You could scour the local hamfests for such a beast, but I would be reluctant to pay more than \$20. With no way to ascertain whether or not it actually works you'd be taking a big chance spending more. Pay only as much money as you are prepared to lose.

The exceedingly knowledgeable and patient will be tempted to build their own 1691 downconverter. I refer them to the August 1992 issue of *73 Amateur Radio Today*, page 58, the "Above & Beyond" column written by C.L. Houghton WB6IGP. This column tantalizes us with the prospect of turning an old Ku LNB into "...a good low-noise weather satellite RF amplifier, 1691 MHz..."

Realistically, very few of us will attempt it, which leaves only the new off-the-shelf genuine article which can be had from many sources for around \$500. Yes, it's a totally outrageous price.

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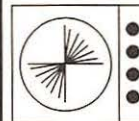
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Weathersat downconverters are where TVRO downconverters were 12 years ago. Many home dish experimenters paid \$600 and up for a 120 degree LNA which can't even be given away today. Until the weathersat industry experiences the same kind of 90,000 units per month sales that the TVRO industry did just 10 years ago, the prices will stay high.

**M<sub>T</sub>**

LNA—Low Noise Amplifier  
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TVRO—Television Receive Only



## Buying, Rejuvenating and Using Older Radios

A lot of newcomers purchase, or are given rigs from the 50's, 60's and 70's and do not have the manual or someone to tell them how to use that particular rig. Some of these rigs are real bargains, others are dogs (usually were when they were new, too). Is it possible to reduce the frustration involved in obtaining and using older equipment? Of course! For starters:

- Stick to well known names such as E.F. Johnson, Collins, National, Hammurund, Hallicrafters, Drake, B&W, Heath or Gonset.
- Purchase Ham Band only units. Most such rigs will cover only 80 through 10 meters (some include 160). Most units from this era will not cover the 30, 17, and 24 meter bands. Exceptions are the Collins R388, R390, Hammurund HQ-140, 145 and 180 series, National HRO and 183 series, Hallicrafters SX-73, SX-117 and the Technical Materials Corp. GPR-90.
- Do not buy any rig without a manual when you are *sure* the manual is obtainable (Sams Photofacts, through Radio Shack, covers most of the receivers from this era.)
- Avoid transmitters that do not have coax connectors for the antenna. If the rig has screw terminals, or cone insulators for the antenna connection, stay away. Ask the seller if the transmitter has a "Pi-net output," which makes it easy to match the antenna, and assists in avoiding TVI and harmonics.
- Reject any piece that has excessive surface rust, frozen or missing tuning dials, unexplained holes in the cabinet/chassis, burnt or smokey odor, mildew or mouldy coloring inside, cut or extra wires, shows signs of having been immersed in water, unusual paint job (i.e., heavy paint or non standard color).
- Take a friend along who knows older gear. Always get the seller's name, call and address.

The very first thing to do with your new (reclaimed) rig is to check the AC cord. Electrical cords deteriorate in a fairly short time, so it is best to simply replace them. Now turn the unit on standby. If nothing smokes or smells hot, let the unit sit for at least five hours. Now turn the high voltage on. With luck the rig will function as though it were brand new.

### Potential Problems with Receivers

The most common complaint is a loud hum in the speaker or headphones. This is usually caused by a bad filter capacitor, easy to replace. There's no need to get an exact replacement. If the capacity is within 40 percent or so, no problem. Voltage rating of the filter capacitor should be the same or higher than the original unit.

Some rebuilders of older gear replace all of the bypass capacitors. I do not unless there is a problem. If the bypass caps are paper and appear to have melted wax on them; do replace them.

The second greatest problem one runs into is tubes. If you are in a ham club, no doubt someone will have a tube checker and be happy to help find the problem tube. Radio Shack will order most receiving tubes for you (their tubes have a lifetime guarantee). Tubes are expensive, so check around. Mail order companies sell tubes, or the same guy with the tube checker may have tubes around he'll sell or give you. If you have the ability or can find someone to help, give the receiver a complete realignment.

**Read the operating manual!** The problem may simply be a matter of turning on the correct switch.

Tube type receivers require high impedance headphones (1000 ohms or more) **Do not use low impedance headphones such as the 8 Ohm units popular with hi fi systems, or sold by Radio Shack as communications headphones.** If you need headphones, check the various parts sources such as Fair Radio Sales (P.O. Box 1105, Lima, OH 45802; 419-223-2196). Speakers for the tube receivers normally were four ohms, but new 8 ohm or higher impedance speakers work fine.

### Potential Transmitter Problems

Transmitters (and receivers) from the 50's and 60's usually operated only CW and AM (amplitude modulation). They are very easy to work on and trouble shoot. The most frequent problem will be calibration of the VFO (variable frequency oscillator) which is the part of the transmitter that determines the frequency of the transmitted signal. Normally all that is required is a tube replacement, and a few peaking adjustments using the transmitter's meter and checking the frequency with a counter or calibrated receiver. VFOs in SSB gear are more difficult to work on and should not be attempted by a novice.

A rough sounding signal can (again) be a bad filter capacitor. Again I suggest at least five hours of run time in the stand-by position before applying high voltage.

Be aware that some early SSB units used TV sweep tubes in the final stages of the transmitter. Such rigs are very intolerant of high SWR and will blow quickly if they do not see under a 2:1 match. Sweep tubes are expensive, and become more expensive when they must be matched in pairs, as required by most of these rigs, in order to run the tubes to full output. The Drake series of transmitters and transceivers were the most notable for using sweep tube finals.

Some transmitters are crystal controlled. That means that you must have several crystals to change frequency. Any crystal controlled transmitter can be converted to operate with a VFO by building or buying a VFO; in most cases all



that is necessary is to plug it into the transmitter (read the manual).

Transmitters (and transceivers) built in the latter part of the 60's up to the present will cover SSB as well as CW and AM. Some of them are easy to work on, but get a competent technician to help.

Some older transmitters are difficult to use with modern keyers, so check with an experienced ham. Usually a relay can be set up to key the rig. Audio inputs will normally be high impedance, which means using a crystal or ceramic microphone.

**USE CAUTION!** High voltages are present and can be lethal! Never work on them alone. In no case should you have your hands inside the rig when the high voltage is on!

### Do All Older Units Have Problems?

No. I have a Viking Adventurer (E.F. Johnson) transmitter, crystal controlled, which runs 50 watts on 80 through 10 meters CW only. The receiver is a Heath HW-10, also covering 80 through 10 meters. Both units cost 20 bucks and work fine.

Covering 160 through 10 meters CW and AM is an E.F. Johnson Viking Ranger (VFO control at 65 watts). The receiver is a National NC-300. The transmitter required minor peaking of the VFO (a one hour job) and the receiver worked as soon as it had high voltage applied. Both of these rigs are tops for CW. The Ranger is one of the better AM rigs of its day (and today, too) while the 300 is a fabulous receiver (160 to 10 CW, SSB and AM) with sharp selectivity and good sensitivity. I paid \$75.00 for the Ranger and \$70.00 for the 300.

I built the venerable Heathkit HW-101 in 1972, and it has been running since with no problems. It covers 80 through 10 CW and SSB at 180 watts.

A Ten-Tec Argonaut rounds out the collection. It is entirely solid state and runs five watts power on 80 to 10 on SSB and CW. It's an excellent choice for QRP. The unit was purchased with a 30 amp power supply, transmatch and 100 watt amplifier for only \$200.00. It only required restringing the dial (a half hour job). Ten-Tec is a US company, and they offer superb service. The Argo runs full break in (QSK) on CW allowing the operator to hear signals on frequency as he is sending—a nice feature.



# Rob Leonard's

## Ham DX Tips

In the U.S., November means Thanksgiving, football, cool weather, and DX! Besides CQ magazine's CQ World Wide CW contest the last weekend of the month, this is when DX really starts to show up on 80 and 40 meter SSB, 75 and 40 CW.

**ANTIGUA** V21BF, who is Alan B Scholl (Box 1111, St John's, Antigua, West Indies), wrote to tell us that not only is he an avid *MT* reader but also: "I am generally found on 10 meters (when it's open) and 17 meters. Since I am new, I don't care for pile ups, so I don't venture on the other bands just yet. But, anyone interested in DX with V21BF look on 17 meter CW from 18068 to 18110 kHz and SSB around 18110 to 18160 kHz between 2100 to 0100 UTC. If 10 meters is open look between 28010 to 28060 kHz CW and 28350 to 28550 kHz SSB. I normally spend more time on Sat and Sun mornings. I don't limit myself to these bands; I also scout around on 12 meters, 15 meters, SSB and CW; 30 meters CW; as well as 80 and 40 meter CW and SSB." **BERMUDA** The Bermuda Net meets every Sunday on 14275 kHz SSB at 1330 UTC. A great place to find not only Bermuda (VP9 prefixed hams) but many Caribbeans as well. **CANADA** Hams in Ontario will soon be sporting a new permanent prefix, VA3, as well as their present VE3. Starting April 30th, the new prefix for amateurs in New Brunswick will be VE9 (a prefix formally used by Canadian Dept. of Communications operated amateur club stations). Newly licensed amateurs will be assigned the VE9 prefix, while those already licensed will be offered it as an option. Of course, VE1 will still be used by amateurs in Nova Scotia. NL7TB, John Reisenauer, writes that he and NL7J "will again be active from Beaver Creek in the Yukon Territory, from November 19 through the 22nd." John adds that they will be active "around the clock" on CW/RTTY/ and SSB on 15, 20, 40, and 80 meters (and maybe 17 and 12 meters). During the ARRL Sweepstakes, they plan to operate from VY1QST as guest operators; otherwise, the two will operate from John's motor home which is equipped with a 1 kW amp, tribander and dipole antennas mounted on the roof. A "full-color special events QSL" will be available. QSL direct with SASE or IRC's to: John Reisenauer, NL7TB, 3605 Arctic Blvd 1830, Anchorage, AK 99503. **CHRISTMAS ISLAND** Yes, it's Christmas in November, as WC5P (Ben Holloman, 9916 Harwick Dr., Dallas, TX 75220) operates T32BE, and KH6DFW (Takeo Kuwada, Box 1711, Kailuakona, HI 96740) is active as T31BI. November 24 to 29 on 10 to 160 meters (not including the WARC bands) will be mostly CW with some SSB. During the CQ World Wide CW contest 27 and 28 November, they will operate exclusively on CW, all bands, around the clock. **GREENLAND** 7005 kHz CW is the place, 2200 UTC is the time, and OX3MZ is the amateur, while the QSL route is OZ1KHZ, Davis James Lee, Vaarstvej 65, DK-9260 Gistrup, Denmark. **OMAN** A45XC is on 14085 kHz at 1630 and 1700 UTC daily. He is an employee of Shell Oil and asks that you QSL him via the Royal Omani Radio Club, Box 89, Muscat, Oman. **PAPUA NEW GUINEA** P29DX is on 1831 kHz or 3505 kHz CW between 0900 and 1000 UTC daily. QSL to Steve Televis Love, P.O. Box 7416, Borokoinced, Papua New Guinea. **VATICAN STATE** Satellite DXers can try 145.890 kHz for HV4NAC on Oscar 13 on SBB and CW. QSL to IK0FVC, Francesco Valsecchi, Via Scalindri 47, I-06100 Perugia, Italy.

Enjoy the DX and the holiday feasts! 73 de Rob

### Using It!

There are some differences to using these mature rigs; read the manual!

When tuning a signal (CW) you will note that as you tune slowly through a signal, the tone will rise to a peak, then fall off to where only a hissing sound is heard (this point is called zero beat). As you continue tuning, the note will return to a high pitch and gradually fall off. The best way to be sure of being right on frequency is to tune the signal in the receiver to zero beat, then tune the transmitter's VFO 'til it, too, is at zero beat. Now tune the receiver slightly off to one side so the signal is audible, and call the station. Zero Beating is discussed in the *ARRL Handbook* in great detail.

Recycled rigs require a relay to change the antenna from transmit to receive. Any double pole double throw relay will work. Most rigs require 115 volt AC relays; some use 12 or 24

volt. Simply connect the antenna input to the common terminal, the transmitter to the normally open side and the receiver to normally closed. If you wish, a good quality hand-thrown switch will also work. If there is no relay control output on the transmitter or receiver, use a simple 12 volt power supply with a 12 volt relay and a foot or hand switch to do the changeover task.

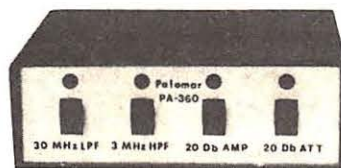
Most receivers have muting terminals to quiet the receiver when transmitting. A second set of contacts on the changeover relay takes care of this.

### Didah Di Dah Dit...

Well folks, we have run out of column. Should you have any questions concerning older gear, please drop me a note at *MT* headquarters. Happy Thanksgiving!

*MT*

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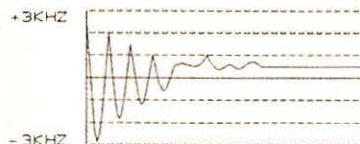
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# Pirate Band Spanish QSOs Identified

Virtually every pirate DXer has heard a puzzling set of two-way Spanish language QSO communications that operate within the 41 meter band on a virtually daily basis. These communications nets are actually heard on literally dozens of frequencies throughout the high frequency shortwave bands. Two of the nets, usually heard around 7416 and 7465 kHz, create some interference to two of the most active frequencies used by North American pirate radio stations.

Many rumors have circulated about the purpose of these bootleg QSO's, which put in a good signal in North America. They have been attributed to fishing fleets, military guerrillas, drug smugglers, taxicabs, and many similar functions.

ACE member and *MT* reader Alvin Mirabal of Saint Just, Puerto Rico, adds some extremely interesting information to the pool. Alvin's bilingual talents in English and Spanish are quite valuable for this type of monitoring. He has listened to the 7416 (variable) kHz nets over a period of several months.

Alvin reports that there are many different Spanish language bootleg networks using these pirate band frequencies. One of the most interesting is operated by a shipping company headquartered in Colombia, with offices in Panama. The conversations usually involve mundane chit-chat about family matters, late payments, and the like. But Alvin is amused by occasional boasts among net members about "romantic exploits."

Alvin finds that other Spanish two-way bootleg nets on 7416 kHz appear to be agricultural communications, conversations between fishing boats in the Gulf of Mexico and Caribbean Sea, and similar miscellaneous transmissions. He accurately points out that communication systems are somewhat inadequate in many Central and South American countries. Bootleg shortwave transmitters provide a simple (albeit illegal) solution to this problem.

We certainly will welcome any additional reports on these Spanish language QSO stations, especially from DXers who are fluent in Spanish. Alvin says that many of the discussions are routine and boring, but some spicy gems are sometimes mixed in!

## TV Marti Blows It Again

A Cuban MIG fighter pilot defected to the USA on September 17 by flying his aircraft from Cuba to a United States military facility in Key West, FL. The incident created controversy because the MIG was not detected in flight by US military, commercial, or drug interdiction aircraft radar systems!

Howard Kleinberg, in a column distributed by Cox News Service, linked the poor performance of US radars to TV Marti! Kleinberg quotes Major Jim Bates, a Colorado Springs spokesman for the North American Aerospace Defense Command, who said "the one remaining Defense Department radar balloon in the Florida Keys is assigned to transmitting broadcasts of TV Marti to Cuba rather than catching incoming (aircraft) from that island." The NORAD spokesman commented that "It was determined the Operation TV Marti was a priority over air defense." Kleinberg said that the US Defense Department would neither confirm nor deny the NORAD charge.

A few days after the defection, a group of reporters near Havana tried to pick up the TV Marti signal. According to the UPI report (forwarded to us by Dave Alpert), they were unsuccessful.

## Two Good Cuban Targets

Almost every month we receive questions from new shortwave DXers about unlicensed political clandestine stations. Many of us would like to log some clandestines, but we need some tips about where to look.

Most "pure" shortwave clandestines (who use their own transmitters) are currently targeted toward the Middle East. According to Mathias Kropf in the *Radio von Unten* bulletin, at least 60 different Middle Eastern clandestine programs are scheduled daily on shortwave from nearly two dozen stations. Nine additional Middle Eastern clandestines operate on FM, particularly in Lebanon.

For those of us in North America, two good "pure" clandestine targets are easily audible every day. Both are anti-Castro stations targeted to Cuba. **Radio Caiman** uses 9965 kHz, while **La Voz del CID** dominates 9941.7 kHz. Both of these are scheduled every morning and evening, although **CID** moves to 6305 kHz late in the evening. Check them out!

## Vatican Numbers QRM

Longtime *MT* reporter Bob Thomas of Bridgeport, CT, notes that **Vatican Radio's** 11620 kHz frequency often suffers interference from a female voice German language numbers station around 0300 UTC. Most numbers broadcasts operate regularly on stable frequencies. However, Bob curiously notices that the center frequency of this numbers operation is somewhat variable. The situation is unusual, and it is unclear if Vatican Radio is aware of the problem.

## WRMR Gets Publicity

DXpert David Alpert of New York City forwards a late summer Associated Press wire story about medium wave pirate **WRMR**. *MT's* Karl Zuk joins the list of DXers who have recently logged this station on 1620 kHz. They operate sporadically, but when they are on, they tend to transmit for hours.

The AP article quoted Richard M. Smith, FCC chief of field operations, who warned **WRMR** that it could face a fine of \$8,000 if the FCC catches them. Smith said, "Some of these (pirate) stations operate very briefly and sporadically. They're kind of fluid."

## What We Are Hearing

Another large bumper crop of pirate loggings arrived in Brasstown this month. We welcome input from all *MT* readers! Pirate activity continues at a brisk pace. As you may know, Halloween is traditionally a very big holiday for increased pirate broadcasting. This would be an excellent time to tune around the bands.

Mike Leclerc and other readers point out that the North American pirate frequency situation seems to be firming up. Most stations are still found on 41 meters, approximately +/- 10 kHz around 7415 and 7465 kHz. A smaller but noticeable cluster of pirates can be found around 6250 and 15050 kHz. As this month's loggings confirm, weekend evenings, holidays, and Sunday mornings around 1330 UTC are the best times to scan for pirate stations.

Maildrop correspondence addresses used by pirates listed this month include PO Box 452, Wellsville, NY 14895; PO Box 109, Blue Ridge Summit, PA 17214; PO Box 605, Huntsville, AL 35804; PO Box 146, Stoneham, MA 02180; PO Box 293, Merlin, Ontario N0P 1W0, Canada; 82 Pentland Place, Kirkcaldy, Scotland, UK; and PO Box 29, Moscow 109444, Russia. Remember, reception reports to USA pirate addresses must include three mint first class stamps. Foreign stations require \$1 US cash for return postage. Times are listed here in UTC, with frequencies in kHz:

**Cheese Radio-** 7415 at 0100. Cheeto's jazz music programming emerged over the summer. He said that reception reports should be sent to *MT*, but he instead should establish a relationship with a maildrop service. Addr: None. (Mike Leclerc, Somers, CT)  
**CRSM-** 7468 at 0145. Rob Roy of **Radio Scottish Montreal** now uses these call letters for his features about Scotland ethnic activities in Quebec. Addr: Blue Ridge Summit. (Leclerc)  
**CSIC-** 7410 at 0200. Pirate Rambo hosts Canada's most active and popular pirate. He still uses the song



**Shortwave Radio Pirates!**  
**QSL# 96**

**The Radio Airplane!**

TO: Max Syko

TIME: 02:20 UTC DATE: 7/6/93 FREQ: 7415 USB

Thanks for listening! *135 Cape Eddy*

# Max Syko's new Radio Airplane "FCC Fighter" QSL.

"Psycho Chicken" as an interval signal. Addr: Blue Ridge Summit for USA, Merlin for Canada. (Leclerc)

**Down East Radio-** 7465 at 0100. The station features a New England theme, often with comedy via a **North American Pirate Relay Service** relay. Addr: Blue Ridge Summit. (Leclerc)

**Ground Level Network-** 7465 at 0000. Their announcer, "Just Bob," normally features rock music and calmly delivered health tips, but he recently ran a feature about Texas UFO sightings. Addr: Wellsville. (William T. Hassing, Mt. Prospect, IL)

**He Man Radio-** 7415 at 2330. He Man's testosterone level seems to have grown. Kristin Kaye of "Signals" has fled the pirate scene, so He Man's sexism parody now targets female DXers. William editorializes that their music in upper sideband mode sounds like a tin can. Addr: Blue Ridge Summit. (Hassing)

**Hit Parade Radio-** 6250 at 0100. Dale Donnan broadcasts hit 1960's music in the top 40 AM radio style that was popular 30 years ago. Mark points out that the area around this 49 meter frequency is seeing more pirate activity lately. Addr: Wellsville. (Leclerc)

**K-2000-** 7415 at 0245. Paul's log of their amusing Glenn Hauser parody, followed by a reception report, produced a nice QSL, a personal letter, and a listener survey form. Nice catch, Paul! Addr: Stoneham. (Paul Doherty, Lunenburg, MA)

**North Jersey Coast Radio-** 7415 at 2300. James heard them with New Jersey rock music by Bruce Springsteen, plus plugs for David Letterman's new CBS-TV show. Addr: Wellsville. (James Laughlan, Youngstown, NY; Leclerc)

**Pirate Radio Boston-** 7465 at 2345. Charlie Loudnboomer was assisted by Mr. X during their first anniversary show, which included rock music and a listener mailbag. Addr: Stoneham. (Leclerc)

**Radio Airplane-** 7465 at 0245. Captain Eddy's "FCC Fighter" aircraft is still the mobile base for rock and comedy pirate broadcasts. Max Syko of MI nabbed the fancy new QSL that is pictured here. Addr: Wellsville. (Lytle; Syko; Leclerc)

**Radio Esoterica-** 7410 at 0200. Moriarty plays an eclectic mix of musical styles, so his station name is descriptive. They sometimes are relayed via the **CSIC** transmitter. Addr: Stoneham. (Leclerc)

**Radio Fluffernut-** 7465 at 0300. They have a clever station name, but their broadcasts normally are fairly standard rock fare. Addr: Merlin. (Chris Schemer, St. Louis, MO; Leclerc)

**Radio Stella International-** 6250 at 0200. This Euroirate, which programs rock music with host Jock Wilson, has been heard several times in 1993 via the **North American Pirate Relay Service** transmitter. Addr: Kirkcaldy. (Leclerc)

**Romantic Space Radio-** 7465 at 0115. The genuine Russian technopop pirate has resumed with another special North American program via a **NAPRS** relay. Arty says that he received several reception reports for their earlier special North American show, and that more reports are welcome. Here's your chance to hear some really unusual SWBC DX! Addr: Moscow. (George Zeller, Cleveland, OH)

**Solid Rock Radio-** 7465 at 0200. Dr. Love has been very active lately with short test transmissions. His staple format is accurately described in the station name. Note their new QSL, which is pictured here. Addr: Wellsville. (Hassing; Leclerc; and direct from the station)

**Voice of Laryngitis-** 7416 at 2330. I heard the Huxley's extremely entertaining veteran comedy station on my car's Philips DC-777. You should check out both the receiver and the station, since both are excellent. Addr: Wellsville. (Zeller)

**Voice of Stench-** 7465 at 0000. Recent broadcasts from Eddie Egghead Johnson have featured rock, comedy, and commentary on TV preachers. They spell out their identification very slowly, which greatly assists DXers who are trying to hear weak pirate signals. Addr: Wellsville. (Scheiner)

**WJLR-** 7415 at 0230. Captain Crook at "John Lennon Radio" has been transmitting his rock shows in the unusual double sideband (DSB) mode. Both the upper and lower sidebands of his signal are modulated, but there is no carrier present. Addr: Blue Ridge Summit. (Leclerc)

**WEED-** 7465 at 0400. They still appear regularly with a very well produced mix of rock, comedy, and pro-marijuana advocacy "from the great southwest." Their verification speed and reliability is erratic, but a trickle of long-delayed QSL responses is surfacing. Chris heard them in the daytime at 1400 UTC. Addr:

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GMT	FREQ	RST
01:09	7415	---
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PSE QSL TNX DR73 LOVEOPR		

## Dr. Love's high tech Solid Rock Radio verie.

Huntsville. (Brian Castleberry, Jackson, MS; Hassing; Scheiner; Lytle; Leclerc)

**Wire Line Radio-** 15042 at 0030. They occasionally sneak up here to 19 meters, but are also regularly heard on 41 meters. Gigi reports a nice recent QSL from them. Addr: Blue Ridge Summit. (Lytle; Leclerc)

**WKEK-** 7415 at 0145. This one still announces a Jacksonville, FL, location, sometimes with rebroadcasts of old defunct "Signals" programs. Otherwise, they feature rock or relays of local licensed broadcasters. Addr: Wellsville, but a very poor verifier. (Castleberry)

**WLIS-** 7413 at 0200. Charles Poltz maintains a highly unique format. All shows play actual interval signals from licensed international broadcasting stations. Every WLIS QSL, including John's, feature at least one picture of Ian MacFarland. Addr: Blue Ridge Summit. (John Vercellino, Downers Grove, IL; Leclerc)

**WQSL-** 6250 at 0000. The slogan of this station, appropriately enough, is "The Verification Station." They play rock that is mixed with test announcements and identifications delivered in a very slow cadence. Addr: Wellsville. (Leclerc)



# The 1947 Zenith Transoceanic Model 8G005

By Linton G. Robertson

The Zenith company is one of the few manufacturers left over from "The Golden Age of Radio" that is still whacking away and making good quality gear. Zenith appeared on the American scene as Chicago Radio Labs in the year 1918. The moniker "Zenith" popped up in 1923, and came from 9ZN, the callsign of its founders, Ralph Matthews and Karl Hassel. When Cdr. Eugene McDonald joined the group in 1921, things really began to take off. With Admiral McMillan's polar expeditions lending great impetus to the effort, Zenith was becoming a pioneer in shortwave equipment. One of the outgrowths of one of these expeditions was the "Transoceanic" radio series. The first one appeared in 1941.

These sets were an enormous marketing success, and Zenith made mountains of money off them. People just couldn't get their hands on them fast enough. One of its attractions was the number of adult interactive toys that one found inside various compartments in the set! But I anticipate.

I picked up the 8G005 for a mere \$3 at a swap meet in late 1984. Even considering the fact that the set needed considerable work to bring it up to factory-fresh performance and appearance, this was a bargain not to be believed! Standard restoration procedures were instituted on the electronics and black leatherette exterior, and things seemed to be falling in line pretty well. The set fired up, ran like a dream for three weeks, and dropped deader than last Friday's mackerel.

This was something I'd seen before, and dreaded when it happened: coil trouble. As the little antenna, mixer, oscillator and IF coils were very small, fragile and something of a pain to work on, troubleshooting proceeded with trepidation. The worst had occurred: not one, but *two* IF coils had left home!

It's possible to repair these things, provided you have excellent eyesight, a jeweler's set of optics, and the hands of Dr. Kildare, but only when the break in the hair-thin, 2000-foot winding of #42 wire is on the outside of the coil assembly. You guessed it: it wasn't! As I hate to replace these IF cans with anything less than exact replacements, a



year-long search for the right combination of a good chassis, a rotten case, and a willing seller ensued.

Once found, the fellow sent it out upon receipt of my check. The very next day, the cellar the chassis had been sitting in was flooded in some of the worst storms Missouri had seen in decades! Talk about close calls...

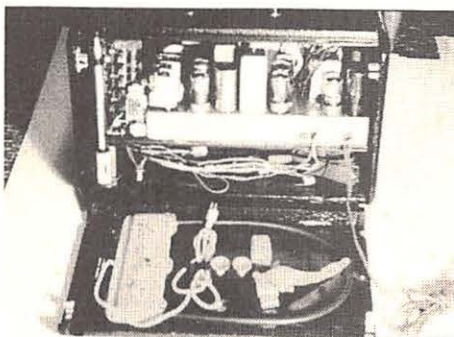
Well, it came out just fine, I'm very happy to say, and the set still plays to beat the band today! Every time I look at it, I think of how

unbelievably lucky I am to have gotten that chassis!

Now, looking at the set all nicely folded up in its black leatherette traveling case, it's hard to tell just what it is at first glance. (People seeing it for the first time have called it everything from an overnight bag to a sewing machine.) Only the very understated word "Zenith" on the brass latch gives it away. One opens the set up, pops the antenna release open with a loud "Pongggg," extends the "Waverod" to its fullest expansion, and one is ready for reception on BCB, 49, 31, 25, 19, or 16 meters! Or is one?

Nope, first you have to go through the instructions. These are located in a wee compartment below the main dial. Opening it up, a small booklet leaps out with the words, "Know Your Zenith" printed in small, delicate little letters on the cover. (Close the compartment and the little book jumps back in. Nice touch, eh? The Scotsmen running this outfit were definitely not asleep on their feet.)

Reading the instruction manual through, you learn that the set runs on AC, DC, or internal batteries. It also come with detachable "Wavemagnets" for BCB and shortwave,





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suction cups for attaching these devices to glass windows (should you, as the manual states, "be in a metal bus, train, plane, or building that makes reception difficult...") and extension lines to run from the "Wavemagnets" back to the set. All this stuff was located in the back of the set in yet another compartment!

The performance of these sets is rather good for the period they were made in. The audio is very adequate, and can be tailored to suit with the four-switch "Radiorgan." Sensitivity is about what you'd expect, but the set has, on occasion, pulled in Greece and Albania with the gain wide open. Calibration was remarkably good, and one could find one's desired station with a minimum of hair-pulling.

Battery operation was accomplished by detaching the AC plug from the wall, opening the back of the set, and plugging the wall plug into a receptacle that contained a multi-pole, double-throw switch. This disconnected the rectifier tube from the circuit, and realigned the configuration of the power supply to accommodate battery operation. A dial light was something that would have eaten up the rather expensive batteries up rather quickly, so this feature was not used. To show that the set was on, a little red flag on the dial panel

drops down when the set is turned on. When off, the flag is black and fades into the black-dial motif. Neat little trick, eh?

And the tubes? I thought you'd never ask...

RF: 1LN5

IF: 1LN5

PHASE INVERTER: 1LE3

AC RECTIFIER: 117Z6/GT

CONVERTER: 1LA6

DET/AVC/AF: 1LD5

AF OTJTPUT: 1LB4 (2)

The set travels with me these days; I rigged up an "A" and "B" battery supply for it from currently available stock; there hasn't been a battery made specifically for this thing in 30 years. It's fairly portable, but definitely is not for backpacking. By the way, "portable" in those days still meant anything two men could lift. The set is a nice 22 pound exercise toy (with batteries), but, boy oh boy, what a toy!

*M*

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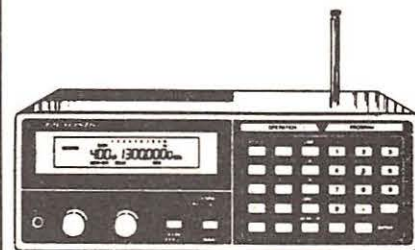
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## Go Ask George ... Zeller That Is!

MT columnist George Zeller and Andrew Yoder have recently updated *The Pirate Radio Directory 1993 Fifth Edition*. For pirate radio enthusiasts, this new edition begins with an indepth introduction to the history of pirate radio in North America. Station profiles are included with schedules, frequencies and maildrop addresses for QSLing, plus a handy index of inactive station profiles in past editions of 1989-1992.

For the QSL hound, George and Andrew delve into the important do's and don'ts of pirate QSLing, and some unique strategies are recommended to help you through the pirate station QSL process.

Available through Grove Enterprises (BOK-46), *The Pirate Radio Directory* should be on your bookshelf — It's on mine!

### BOTSWANA

VOA Relay Station, 7415 kHz. Full data 'Sunrise Over Antenna' card, signed by John Vodenik. Received in 1 week for an English report. Station address: Bethany Relay Station, P.O. Box 227, Mason, OH 45040. (Sam Wright, Biloxi, MS)

### COMMONWEALTH OF INDEPENDENT STATES

Radio Netherlands, 12065 kHz. Full data antenna farm card for relay via Petropavlovsk Kamchatsk, without veri signer. Received in 1 month for an English report and 2 IRCs. Station address: P.O. Box 222, 1200 JG Hilversum, The Netherlands. (Ed Rausch Cedar Grove, NJ) (Frank Hillton, Charleston, SC)

### COTE D'IVOIRE

ASECNA, Aerodrome d'Abidjan Port-Bouet, 8861 kHz USB. Full data letter signed by A. Fadiga. Received for a utility report, mint stamps, 1 IRC, and an address label (not used). Station address: ASECNA, Representation en Cote D'Ivoire, 15 Boite Postal 918, Abidjan 15, Republique de Cote D'Ivoire, Afrique. (Hardester, NC)

### FRANCE

Radio France International, 12350/6175 kHz. Full data Eiffel Tower card, without veri signer. Received in 1.5 months for an English report of 2nd harmonic on 12 MHz maritime simplex frequency. 6175 kHz only acknowledgement on QSL card. Station address: Boite Postal 9516, Paris, France. (Rausch, NJ)

### GERMANY

DDH9, 11039 kHz. Full data letter, signed by Polowy. Schedule for RTTY broadcasts included. Received in 42 days for a copy of RTTY report, 1 IRC, and souvenir postcard. Station address: Deutscher Wetterdienst, Zentralamt Offenbach, Postfach 100 465, Frankfurterstrabe 135, 6050 Offenbach am Main, Germany. (Martin Nagl, Neulengbach, Austria/DX Club ADXB.)

### ICELAND

Icelandic Broadcasting Service, 11401 kHz. Full data

'Hot Springs' cards, without veri signer. Received in 3 weeks for a taped report and mint stamps. Station address: Rikisutvarpid, Icelandic National Broadcasting Service, Efstaleiti 1 150, Reykjavik, Iceland. (Rausch, NJ)

### JAPAN

Radio Japan, 17810 via Yamata. Full data 'Shirakawa Village' signed by H. Kawamoto. Received in 1.5 months for an English report and mint stamps. Station address: 2-2-1 Jinnan, Shibuya-ku, Tokyo 150-01 Japan. (Rausch, NJ)

### KAZAKHSTAN

UL7BJ, 14085.5 kHz. Full data QSL card. Received in 100 days for a copy of RTTY report, one U.S. dollar, and souvenir postcard. Station address: c/o Serge B. Kovalev, Box 7, 473 000 Tselinograd, Kazakhstan. (Nagl, Austria)

### NEW ZEALAND

ZLW, 17170 kHz. Full data letter, with illegible veri signature. Received in 56 days for a copy of CW report, and 1 IRC. Station address: Telecom Network & Intl. Ltd., Wellington Marine Radio, Wellington, New Zealand. (Nagl, Austria)

### PIRATE

Pirate Radio Boston, 7413 kHz. Full data Boston Swan Boat card. Received in 7 days for an English report and 3 mint stamps. QSL maildrop: P.O. Box 146, Stoneham, MA. 02180 (Harold Frodge, Midland, MI) *Blue Ridge Summit drop will QSL, too. (GVH)*

He Man Radio, 7415 kHz. Full data Sun Spot Cycle sheet. Received in 68 days for an English report and 3 mint stamps. QSL maildrop: P.O. Box 109, Blue Ridge Summit, PA 17214. (Frodge, MI)



*John Flake of Charlotte, NC, submits this scenic QSL from Radio Moscow.*

WQSL, 7415 kHz. Full data orange "Worthless Piece of Paper," signed by Ken Hill, also sent a personal note. Received in 16 days for an English report and 3 mint stamps. QSL maildrop: P.O. Box 452, Wellsville, NY 14895. (Frodge, MI)

Ground Level Network, 7440 kHz. Full data crowd card, signed by "Just Bob." Received in 19 days for an English report and 3 mint stamps. QSL maildrop: P.O. Box 452, Wellsville, NY 14895. (Frodge, MI)

WMAD, 7435 kHz. Full data "Who's the Schmuck with Babe" sheet. Received in 52 days for an English report and 3 mint stamps. QSL maildrop: P.O. Box 452, Wellsville, NY 14895. (Frodge, MI)

The Radio Airplane, 7417 kHz USB. Full data card (#56), info sheet and laminated book marks. Signed by Captain Eddy. Station was reported as UNID in club bulletins. Station verified via the Wellsville, NY, maildrop. (Mike Hardester, Jacksonville, NC)

### SHIP TRAFFIC

SAN MARTIN, DPSM, 156.65 MHz. (Container Vessel) Full data letter and photo of vessel, signed by D. Kopke-Master. Received in 12 days for an English utility report, and one U.S. dollar. Ship address: Reederei Claus-Peter Offen, Gansemarkt 24, 2 Hamburg 36, Germany. (Hank Holbrook, Dunkirk, MD)

PINA PRIMA, IBWR, 156.65 MHz. (Bulk Carrier) Full data letter verified by British Officer. Received in 48 days for an English utility report and one U.S. dollar. Ship address: Augustea Empresa Maritima di Salvataggi spa, Sede Legale Ed Operativa Augusta (SR), Direzione Amministrativa, 80133 Napoli, Italy. (Holbrook, MD)

SPIRIT OF ST. JOSEPH, WUX4514, 156.65/156.30 MHz (Cruise Boat-Triple Deck Paddlewheeler). Full data prepared QSL card signed by Peg Montepare. Received in 17 days for an English utility report and mint stamps. Ship address: Pegasus Riverboat Company, Inc., 40 Riverside Ave., Rensselaer, NY 12144. (Holbrook, MD)

SIRIUS HIGHWAY, 3ELV3, 156.65 MHz (Pure Car Carrier). Full data QSL letter. Received in 33 days for an English utility report, and one U.S. dollar. Ship address: BS Japan Co., Ltd., 7-9 Yaesu 2-Chome, Chuo-Ku, Tokyo 104, Japan. (Holbrook, MD)

### SINGAPORE

BBC Far East Relay Station, 9740 kHz. Full data transmitter site card, signed by Resident Engineer. Received in 1 month for an English report and 2 IRCs. Station address: c/o Far Eastern Relay Sta., P.O. Box 434, 26 Olive Rd., Singapore. (Rausch, NJ)

### UNITED ARAB EMIRATES

Radio Abu Dhabi, 11885/15305 kHz. Full data info/QSL sheet, with illegible signature. Received in 17 days for an English report. Station address: Ministry of Information & Culture, UAE Radio Abu Dhabi, P.O. Box 63, Abu Dhabi, UAE. (Frodge, MI)

### VIETNAM

Voice of Vietnam, 15009 kHz. Full data Pagoda card, without veri signer. Received in 2 months for an English report. Station address: Overseas Service, Voice of Vietnam, 58 Quan Su Street, Hanoi, Vietnam. (Rausch, NJ)



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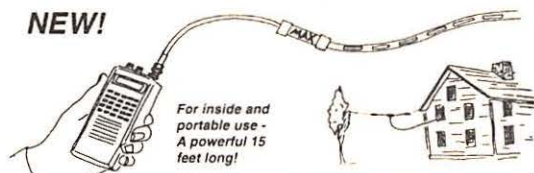
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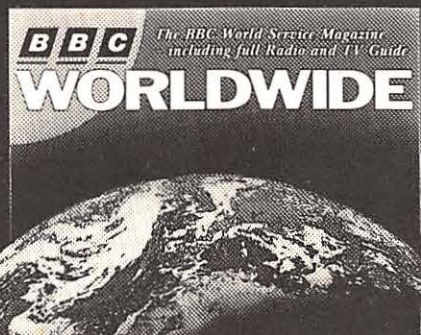
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## How to Use the Shortwave Guide

### 1: Convert your time to UTC.

Eastern and Pacific Times are already converted to Coordinated Universal Time (UTC) at the top of each page. The rule is: convert your local time to 24-hour format; add (during Standard Time) 5, 6, 7, or 8 hours for Eastern, Central, Mountain, or Pacific Time, respectively.

Note that all dates, as well as times, are in UTC: for example, the BBC's "John Dunn Show" (0030 UTC Sunday) will be heard on Saturday evening (7:30 PM Eastern, 4:30 PM Pacific) in North America, not on Sunday.

### 2: Choose a program or station you want to hear.

Some selected programs appear on the lower half of the page for prime listening hours—space does not permit 24-hour listings except for the "Newsline" listing, which begins on the next page.

Occasionally program listings will be followed by "See X 0000." This information indicates that the program is a re-run, and refers to a previous summary of the program's content. The letter stands for a day of the week, as indicated below, and the four digits represent a time in UTC.

S: Sunday T: Tuesday H: Thursday A: Saturday  
M: Monday W: Wednesday F: Friday

### 3: Find the frequencies for the program or station you want to hear.

Look at the page which corresponds to the time you will be listening. Comprehensive frequency information for English broadcasts can be found at the top half of the page. All frequencies are in kHz.

The frequency listing uses the same day codes as the program listings; if a broadcast is not daily, those day codes will appear before the station name.

Irregular broadcasts are indicated "tent" and programming which includes languages besides English are coded "vl" (various languages).

### 4: Choose the most promising frequencies for the time, location, and conditions.

Not all stations can be heard and none all the time on all frequencies. To help you find the most promising frequency, we've included information on the target area of each broadcast. Frequencies beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible. Every frequency is followed by one of these target codes:

am:	The Americas	as:	Asia
na:	North America	au:	Australia
ca:	Central America	pa:	Pacific
sa:	South America	va:	various
eu:	Europe	do:	domestic broadcast
af:	Africa	om:	omnidirectional
me:	Middle East		

Consult the propagation charts. To further help you find the right frequency, we've included propagation charts at the back of this section, which take into account conditions affecting the audibility of shortwave broadcasts. Simply pick out the region in which you live and find the chart for the region in which the station you want to hear is located. The chart indicates the optimum frequencies for a given time in UTC.

**Programs for Shortwave Listeners:** This section, published quarterly, lists programs with news and information about shortwave radio for listeners. For brevity, only programs at certain peak listening times are included.

<b>Sundays</b>			
0011	Spanish National Radio: <i>DX Spot</i>	2145	Radio Bulgaria: <i>Radio Bulgaria Calling</i>
0018	Swiss Radio Int'l: <i>Swiss SW Merry-Go-Round</i>	2235	Radio Korea: <i>Shortwave Feedback</i>
0038	Radio Vlaanderen Int'l: <i>Radio World</i>	2300	Radio For Peace Int'l: <i>World of Radio</i>
0039	HCJB: <i>DX Partyline</i>	2341	Radio Bulgaria: <i>Radio Bulgaria Calling</i>
0110	VOA: <i>Communications World</i>	<b>Mondays</b>	
0111	Spanish National Radio: <i>DX Spot</i>	0000	WWCR [7435]: <i>World of Radio</i>
0123	Deutsche Welle: <i>DW DX Club</i>	0100	WHRI [9495]: <i>World of Radio</i>
0130	WHRI [7315]: <i>World of Radio</i>	0130	Radio Japan: <i>Media Roundup</i>
0200	Radio For Peace Int'l: <i>World of Radio</i>	0145	Radio Bulgaria: <i>Radio Bulgaria Calling</i>
0210	Czech Republic: <i>Calling All Listeners</i>	0430	R New Zealand Int'l: <i>Mailbox</i> (biweekly)
0218	Swiss Radio Int'l: <i>Swiss SW Merry-Go-Round</i>	0445	Radio Bulgaria: <i>Radio Bulgaria Calling</i>
0238	Deutsche Welle: <i>DW DX Club</i>	0640	Radio Korea: <i>Shortwave Feedback</i>
0245	Radio Romania Int'l: <i>DX Mailbag</i>	0700	Radio For Peace Int'l: <i>World of Radio</i>
0309	HCJB: <i>DX Partyline</i>	0730	Radio Australia: <i>Communicator</i>
0317	Radio Budapest Int'l: <i>DX World</i>	0739	Radio Vlaanderen Int'l: <i>Radio World</i>
0323	Deutsche Welle: <i>DW DX Club</i>	1000	Radio Vlaanderen Int'l: <i>Radio World</i>
0330	Radio Havana Cuba: <i>DXers Unlimited</i>	1410	Radio Vlaanderen Int'l: <i>Radio World</i>
0405	WWCR [7435]: <i>World of Radio</i>	2150	Radio Vilnius: <i>DX Program</i>
0410	Radio Australia: <i>Feedback</i>	2240	Israel Radio Int'l: <i>DX Corner</i>
0430	Voice of Turkey: <i>DX Corner</i>	2326	Radio Vilnius: <i>DX Program</i>
0435	WWCR [5810]: <i>Spectrum</i>	<b>Tuesdays</b>	
0509	HCJB: <i>DX Partyline</i>	1130	Radio Australia: <i>Communicator</i>
0511	Spanish National Radio: <i>DX Spot</i>	1330	WWCR [15685]: <i>World of Radio</i>
0518	Swiss Radio Int'l: <i>Swiss SW Merry-Go-Round</i>	1530	Radio Australia: <i>Communicator</i>
0523	Deutsche Welle: <i>DW DX Club</i>	1605	Polish Radio: <i>DX Program</i>
0530	Radio Japan: <i>Media Roundup</i>	1730	Radio Australia: <i>Communicator</i>
0610	Radio Australia: <i>Feedback</i>	1900	Radio For Peace Int'l: <i>World of Radio</i>
0626	Radio Havana Cuba: <i>DXers Unlimited</i>	1930	Radio Australia: <i>Communicator</i>
0810	Radio Australia: <i>Feedback</i>	1941	Radio Bulgaria: <i>Radio Bulgaria Calling</i>
0835	Radio Korea: <i>Shortwave Feedback</i>	2138	Radio Havana Cuba: <i>DXers Unlimited</i>
0940	FEB (Philippines): <i>DX Report</i>	2235	Radio Havana Cuba: <i>DXers Unlimited</i>
1000	Radio For Peace Int'l: <i>World of Radio</i>	<b>Wednesdays</b>	
1040	Radio Korea: <i>Shortwave Feedback</i>	0000	Radio Bulgaria: <i>Radio Bulgaria Calling</i>
1235	Radio Korea: <i>Shortwave Feedback</i>	0039	Radio Havana Cuba: <i>DXers Unlimited</i>
1312	Radio Korea: <i>Shortwave Feedback</i>	0220	RAE Argentina: <i>DXers Special</i>
1420	Israel Radio Int'l: <i>DX Corner</i>	0239	Radio Havana Cuba: <i>DXers Unlimited</i>
1430	Radio Japan: <i>Media Roundup</i>	0300	Radio For Peace Int'l: <i>World of Radio</i>
1435	Radio Korea: <i>Shortwave Feedback</i>	0415	BBC: <i>Waveguide</i>
1635	Radio Korea: <i>Shortwave Feedback</i>	0439	Radio Havana Cuba: <i>DXers Unlimited</i>
1730	Radio Japan: <i>Media Roundup</i>	0539	Radio Havana Cuba: <i>DXers Unlimited</i>
2024	Israel Radio Int'l: <i>DX Corner</i>	0800	HCJB: <i>Ham Radio Today</i>
2040	Radio Korea: <i>Shortwave Feedback</i>	0800	HCJB: <i>Ham Radio Today</i>
2130	Radio Japan: <i>Media Roundup</i>	1030	HCJB: <i>Ham Radio Today</i>
		1100	Radio For Peace Int'l: <i>World of Radio</i>
		1315	FEB (Philippines): <i>DX Report</i>
		1335	Polish Radio: <i>DX Program</i>
		1605	Polish Radio: <i>DX Program</i>
		1700	HCJB: <i>Ham Radio Today</i>
		1900	WHRI [13760]: <i>World of Radio</i>
		1920	RAE Argentina: <i>DXers Special</i>
		1930	HCJB: <i>Ham Radio Today</i>
		2100	HCJB: <i>Ham Radio Today</i>
		2115	Polish Radio: <i>DX Program</i>
		2230	Radio Budapest Int'l: <i>DX World</i>
		<b>Thursdays</b>	
		0100	HCJB: <i>Ham Radio Today</i>
		0130	BBC: <i>Waveguide</i>
		0152	Radio Netherlands Int'l: <i>Media Network</i>
		0330	HCJB: <i>Ham Radio Today</i>
		0330	Radio Budapest Int'l: <i>DX World</i>
		0530	HCJB: <i>Ham Radio Today</i>
		0752	Radio Netherlands Int'l: <i>Media Network</i>
		0830	R New Zealand Int'l: <i>Mailbox</i> (biweekly)
		0952	Radio Netherlands Int'l: <i>Media Network</i>
		1152	Radio Netherlands Int'l: <i>Media Network</i>
		1352	Radio Netherlands Int'l: <i>Media Network</i>
		1552	Radio Netherlands Int'l: <i>Media Network</i>
		1752	Radio Netherlands Int'l: <i>Media Network</i>
		1952	Radio Netherlands Int'l: <i>Media Network</i>
		2322	Radio Vilnius: <i>DX Program</i>
		<b>Fridays</b>	
		0052	Radio Netherlands Int'l: <i>Media Network</i>
		0052	Radio Netherlands Int'l: <i>Media Network</i>
		0252	Radio Netherlands Int'l: <i>Media Network</i>
		0351	Radio Netherlands Int'l: <i>Media Network</i>
		1548	R Portugal Int'l: <i>DX Program</i> (Monthly)
		1918	R Portugal Int'l: <i>DX Program</i> (Monthly)
		1930	R New Zealand Int'l: <i>Mailbox</i> (biweekly)
		2000	Radio For Peace Int'l: <i>World of Radio</i>
		2018	R Portugal Int'l: <i>DX Program</i> (Monthly)
		2210	Radio Australia: <i>Feedback</i>
		2215	WWCR [15685]: <i>World of Radio</i>
		<b>Saturdays</b>	
		0000	Radio Bulgaria: <i>Radio Bulgaria Calling</i>
		0010	Radio Australia: <i>Feedback</i>
		0039	Radio Vlaanderen Int'l: <i>Radio World</i>
		0119	Radio Yugoslavia: <i>RadioHams' Corner</i>
		0130	WHRI [7315]: <i>World of Radio</i>
		0210	Radio Australia: <i>Feedback</i>
		0235	RAE Argentina: <i>DXers Special</i>
		0248	R Portugal Int'l: <i>DX Program</i> (Monthly)
		0400	Radio For Peace Int'l: <i>World of Radio</i>
		0600	WHRI: <i>World of Radio</i>
		0618	Swiss Radio Int'l: <i>Swiss SW Merry-Go-Round</i>
		0730	WWCR [7435]: <i>World of Radio</i>
		0739	HCJB: <i>DX Partyline</i>
		0739	Radio Vlaanderen Int'l: <i>Radio World</i>
		0739	HCJB: <i>DX Partyline</i>
		0915	Swiss Radio Int'l: <i>Swiss SW Merry-Go-Round</i>
		0940	FEB (Philippines): <i>DX Dial</i>
		1009	HCJB: <i>DX Partyline</i>
		1010	VOA: <i>Communications World</i>
		1030	BBC: <i>Waveguide</i>
		1115	Swiss Radio Int'l: <i>Swiss SW Merry-Go-Round</i>
		1200	Radio For Peace Int'l: <i>World of Radio</i>
		1210	VOA: <i>Communications World</i>
		1319	Swiss Radio Int'l: <i>Swiss SW Merry-Go-Round</i>
		1345	Voice of Turkey: <i>DX Corner</i>
		1350	Radio Romania Int'l: <i>DX Mailbag</i>
		1409	Radio Vlaanderen Int'l: <i>Radio World</i>
		1440	FEB (Philippines): <i>DX Dial</i>
		1518	Swiss Radio Int'l: <i>Swiss SW Merry-Go-Round</i>
		1610	VOA: <i>Communications World</i>
		1718	Swiss Radio Int'l: <i>Swiss SW Merry-Go-Round</i>
		1800	Radio For Peace Int'l: <i>World of Radio</i>
		1909	Radio Vlaanderen Int'l: <i>Radio World</i>
		1910	HCJB: <i>DX Partyline</i>
		1945	Radio Romania Int'l: <i>DX Mailbag</i>
		2018	Swiss Radio Int'l: <i>Swiss SW Merry-Go-Round</i>
		2039	HCJB: <i>DX Partyline</i>
		2110	VOA: <i>Communications World</i>
		2130	Voice of Turkey: <i>DX Corner</i>
		2133	Radio Havana Cuba: <i>DXers Unlimited</i>
		2205	Radio Vlaanderen Int'l: <i>Radio World</i>
		2218	Swiss Radio Int'l: <i>Swiss SW Merry-Go-Round</i>
		2230	Radio Budapest Int'l: <i>DX World</i>
		2235	Radio Havana Cuba: <i>DXers Unlimited</i>
		2330	Voice of Turkey: <i>DX Corner</i>



## MT Monitoring Team

Gayle Van Horn, Frequency Manager  
North Carolina

December Deadline: Oct. 29

Jim Frimmel, Program Manager  
Texas

Dave Datko  
California

B.W. Battin  
New Mexico

Jacques d'Avignon  
Propagation Forecasts  
Ontario, Canada

## newslines

"Newsline" is your guide to news broadcasts on the air. • All broadcasts are world news reports unless followed by an asterisk, which means the broadcast is primarily national news. • All broadcasts are daily unless otherwise noted by the day codes.

### 0000 UTC (7:00 PM EST, 4:00 PM PST)

BBC  
China Radio Int'l  
Christian Science Monitor  
FEBC (Philippines)  
Radio Australia  
Radio Canada Int'l [S-M]  
Radio Havana Cuba [W-S]  
Radio Moscow  
Radio New Zealand Int'l  
Radio Norway Int'l [M]  
Radio Thailand  
Radio Ukraine Int'l  
Radio Vlaanderen Int'l  
Spanish National Radio  
Swiss Radio Int'l  
Voice of America (am, as, ca)  
WWCR #3 [T-S]  
0003  
Radio Pyongyang  
0008  
China Radio Int'l\*  
0010  
Voice of America (ca) [T-A]\*  
0012  
Radio Havana Cuba [W/F]\*  
0019  
Radio Ukraine Int'l [M-F]\*  
0030  
HCJB  
Radio Havana Cuba [A-S]  
Radio Moscow  
Radio Nacional de Venezuela [T-S]  
Radio Netherlands Int'l  
Radio New Zealand Int'l [M-F]  
Radio Sweden [T-A]  
Voice of America (am, as, se)  
Voice of America (ca) [S-M] SE  
WWCR #3 [T-A]  
0031  
Christian Science Monitor [T-A]  
Radio Havana Cuba [H]  
0045  
Korean World News Service  
0057  
Spanish National Radio [F]

### 0100 UTC (8:00 PM EST, 5:00 PM PST)

All India Radio  
BBC  
Christian Science Monitor [T-S]  
Czech Republic  
Deutsche Welle  
Radio Australia  
Radio Havana Cuba  
Radio Japan  
Radio Korea  
Radio Moscow  
Radio New Zealand Int'l [M-A]  
Radio Thailand  
Radio Yugoslavia

RAI Italy  
Spanish National Radio  
Voice of America (am, as, ca)  
Voice of Indonesia  
WWCR #3 [T-S]  
0103  
Radio Bulgaria  
0110  
Radio Australia [M-F]\*  
0112  
Radio Havana Cuba [T/W/F]\*  
0123  
Radio Sweden [T]  
0130  
Radio Austria Int'l  
Radio Havana Cuba [S/H/A]  
Radio Moscow  
Radio Netherlands Int'l  
Radio Sweden [T-A]  
Radio Tirana  
Voice of Greece [M-A]  
0145  
BBC (ca) [T-A]\*  
Radio Finland  
0155  
Voice of Indonesia  
0157  
Spanish National Radio [M-F]

### 0200 UTC (9:00 PM EST, 6:00 PM PST)

BBC  
Christian Science Monitor  
Czech Republic  
Deutsche Welle  
KVOH [T-A]  
R Slovakia Int'l [S-H]  
Radio Australia  
Radio Canada Int'l  
Radio Havana Cuba [W-S]  
Radio Moscow  
Radio New Zealand Int'l [M-F]  
Radio Norway Int'l [M]  
Radio Romania Int'l [T-S]  
Radio Thailand  
Radio Yugoslavia  
Swiss Radio Int'l  
Voice of America (am) [T-A]  
Voice of America (as)  
Voice of Myanmar (Burma)  
WHRI #2 [M]  
WWCR #1 [S]  
WWCR #3 [T-A]  
0201  
Radio Romania Int'l [M]  
0203  
Voice of Free China  
0210  
Radio Havana Cuba [W/F]\*  
0215  
Radio Cairo  
Radio Nepal  
0230  
HCJB [M]

Radio Havana Cuba [S/H/A]  
Radio Moscow [T-A]  
Radio Netherlands Int'l  
Radio Pakistan  
Radio Portugal Int'l [T-A]  
Radio Sweden [T-S]  
Radio Tirana  
0231  
Christian Science Monitor [M-A]  
0245  
Korean World News Service

### 0300 UTC (10:00 PM EST, 7:00 PM PST)

BBC  
China Radio Int'l  
Christian Science Monitor  
Deutsche Welle  
HCJB [T-S]  
KVOH [T-A]  
Radio Australia  
Radio Budapest Int'l  
Radio Canada Int'l  
Radio Havana Cuba  
Radio Japan  
Radio Moscow  
Radio New Zealand Int'l [M-F]  
Radio Norway Int'l [M]  
Radio Thailand  
Vatican Radio [F]  
Voice of America (af)  
WHRI #2 [T-A]  
WWCR #3 [T-A]  
0303  
Voice of Free China  
0308  
China Radio Int'l\*  
0309  
BBC\*  
0312  
Radio Havana Cuba [T-F]\*  
0315  
Radio Cairo  
0320  
Radio Philippines [M-A]  
0330  
BBC (af)\*  
Radio Austria Int'l  
Radio Dubai  
Radio Havana Cuba [A]  
Radio Moscow  
Radio Nacional de Venezuela [T-S]  
Radio Netherlands Int'l  
Radio Sweden [T-S]  
0331  
Christian Science Monitor [M-F]  
0340  
Voice of Greece [M-A]  
0345  
Radio Yerevan  
0355  
Radio Japan [W-F/T]

### 0400 UTC (11:00 PM EST, 8:00 PM PST)

BBC  
BBC (af)  
Channel Africa  
China Radio Int'l  
Christian Science Monitor  
Czech Republic  
Deutsche Welle  
Radio Australia  
Radio Canada Int'l  
Radio Havana Cuba [W-S]  
Radio Moscow  
Radio Moscow (na)  
Radio New Zealand Int'l [M-F]  
Radio Romania Int'l  
Radio Thailand  
Swiss Radio Int'l  
Swiss Radio Int'l (eu)  
Voice of America (af)  
Voice of America (eu)  
Voice of Turkey  
WHRI #2 [T-A]  
WWCR #1 [S]  
WWCR #3 [S]  
0403  
Radio Bulgaria  
Radio Pyongyang  
0408  
China Radio Int'l\*  
0411  
Channel Africa [T]  
0412  
Radio Havana Cuba [S/W/F]\*  
0415  
RAI Italy  
0430  
Channel Africa [A]  
Radio Finland [M-A]  
Radio Havana Cuba [A]  
Radio Moscow (na) [H-T]  
Radio Moscow [T-S]  
0431  
Channel Africa [T/H/F]  
Christian Science Monitor [M-F]  
Radio Moscow (na) [W]  
0445  
BBC (af) [T-F]\*  
0450  
Radio Finland [S]

### 0500 UTC (12:00 AM EST, 9:00 PM PST)

BBC  
BBC (af) [M-F]  
Channel Africa  
Christian Science Monitor  
Czech Republic  
Deutsche Welle  
HCJB  
Israel Radio Int'l  
Radio Australia  
Radio Havana Cuba [W-F]

Radio Japan  
Radio Moscow  
Radio Moscow (na)  
Radio New Zealand Int'l [M-F]\*  
Radio Thailand  
Spanish National Radio  
Swiss Radio Int'l  
Swiss Radio Int'l (eu)  
Vatican Radio [A]  
Voice of America (af, eu)  
0501  
Channel Africa [A-S]  
0510  
Radio Australia [M-F]\*  
0512  
Radio Havana Cuba [W-F]\*  
0530  
Channel Africa [F-M/W]  
Radio Austria Int'l  
Radio Moscow (na) [H-T]  
Radio Moscow [M]  
Radio Thailand  
Voice of Nigeria  
0531  
Channel Africa [T]  
Christian Science Monitor [M-F]  
Radio Moscow (na) [W]  
0540  
Voice of Nigeria\*  
0548  
Channel Africa [A]  
0557  
Spanish National Radio [F]

### 0600 UTC (1:00 AM EST, 10:00 PM PST)

BBC  
BBC (af) [A-S]\*  
BBC (af) [M-F]  
Channel Africa  
Christian Science Monitor  
Deutsche Welle  
Radio Australia  
Radio Canada Int'l [M-F]  
Radio Havana Cuba  
Radio Korea  
Radio Moscow  
Radio Moscow (na)  
Radio New Zealand Int'l [A]  
Radio New Zealand Int'l [S-F]\*  
Swiss Radio Int'l  
Voice of America (af, eu)  
Voice of Kenya  
Voice of Malaysia  
WWCR #1 [S]  
0603  
Radio Pyongyang  
0605  
Radio New Zealand Int'l [S-F]\*  
0609  
BBC\*  
0612  
Radio Havana Cuba [T/W/F]\*



<b>0615</b> Radio New Zealand Int'l [A]*	Christian Science Monitor Radio Australia Radio Finland [M-A]	Radio New Zealand Int'l [M-F]* Radio Norway Int'l [S] Radio Vlaanderen Int'l [T-A] Swiss Radio Int'l [eu] Voice of America (as, ca) Voice of Kenya	<b>1209</b> BBC [W]*	Radio Japan Radio Korea Radio Moscow Radio Vlaanderen Int'l [M-A] Voice of America (as)
<b>0627</b> BBC (af) [M-F]*	Radio Korea Radio Moscow Radio New Zealand Int'l [A-S] Radio New Zealand Int'l [M-F]*	<b>1005</b> Radio New Zealand Int'l [M-F]*	<b>1224</b> HCJB [M-F]	WHRI #1 [M-F] WHRI #2 [M-F] WWCR #1 [M-F]
<b>0630</b> Channel Africa [W]	Radio Norway Int'l [S] Voice of Indonesia [A-H] Voice of Malaysia	<b>1008</b> China Radio Int'l*	<b>1230</b> Radio Austria Int'l Radio Bangladesh [S-M]	<b>1408</b> China Radio Int'l*
Radio Havana Cuba [H/A] Radio Moscow Radio Moscow (na) [H-T] Vatican Radio [H]	<b>0803</b> Radio Pyongyang	<b>1030</b> Radio Austria Int'l [M-A] Radio Dubai Radio Korea Radio Moscow Radio Netherlands Int'l Radio New Zealand Int'l [M-F]* Voice of Nigeria [M-F]	Radio Canada Int'l Radio Finland [M-A] Radio France Int'l Radio Moscow Radio Netherlands Int'l Radio Sweden [W-F/T] Voice of Vietnam [T/F] WYFR (Satellite Network) [M-A]	<b>1420</b> Israel Radio Int'l [H]*
<b>0631</b> Christian Science Monitor [M-F] Radio Moscow (na) [W]	<b>0830</b> Radio Austria Int'l Radio Moscow [M-A] Radio Netherlands Int'l	<b>1031</b> Christian Science Monitor [M-F]	<b>1231</b> Christian Science Monitor [M-F]	<b>1424</b> HCJB [M-F] Israel Radio Int'l [T/W/H]
<b>0632</b> Radio Romania Int'l	<b>0831</b> Christian Science Monitor [M-F]	<b>1040</b> Voice of Greece	<b>1253</b> Radio France Int'l [M-A]	<b>1430</b> FEBC (Philippines) Radio Canada Int'l [S] Radio Finland [M-F] Radio Moscow Radio Nacional de Venezuela [M-A]
<b>0640</b> Vatican Radio [T]	<b>0855</b> Voice of Indonesia [A-H]	<b>1100 UTC</b> <u>(4:00 AM EST, 1:00 AM PST)</u> BBC	<b>1300 UTC</b> <u>(8:00 AM EST, 5:00 AM PST)</u> BBC	Radio Netherlands Int'l Radio Romania Int'l Radio Sweden [M-F] Radio Tirana RTM Morocco [S] Voice of Myanmar (Burma) WYFR (Satellite Network) [M-A]
<b>0642</b> Voice of Nigeria [A]*	<b>0900 UTC</b> <u>(4:00 AM EST, 1:00 AM PST)</u> BBC	<b>1100 UTC</b> <u>(6:00 AM EST, 3:00 AM PST)</u> BBC	China Radio Int'l Christian Science Monitor KNLS	<b>1431</b> Christian Science Monitor [M-F]
<b>0645</b> Radio Finland [M-A] Radio Romania Int'l Voice of Nigeria [S-F]*	China Radio Int'l Christian Science Monitor Deutsche Welle Radio Australia Radio Japan Radio Moscow Radio New Zealand Int'l [M-T/H] Swiss Radio Int'l	Channel Africa Christian Science Monitor Deutsche Welle Israel Radio Int'l Radio Australia Radio Ghana [A-S] Radio Japan [A-S] Radio Jordan Radio Moscow Radio New Zealand Int'l Radio Pakistan Radio Ghana Int'l Vatican Radio [M-A] Voice of America (as, ca)	Radio Australia Radio Ghana Radio Korea Radio Moscow Radio Romania Int'l Swiss Radio Int'l Voice of America (as) Voice of Kenya WWCR #1 [M-F] WYFR (Satellite Network) [M-A]	<b>1440</b> FEBC (Philippines) [S-F]*
<b>0650</b> Radio New Zealand Int'l [S-F]* Voice of Med. (Malta)	<b>0908</b> China Radio Int'l*	<b>1103</b> Radio Pyongyang	<b>1303</b> Radio Pyongyang	<b>1445</b> BBC (as) [M-F] (Special English) Voice of Myanmar (Burma)
<b>0653</b> Channel Africa [S]	<b>0915</b> Korean World News Service	<b>1110</b> Radio Australia*	<b>1308</b> China Radio Int'l*	<b>1450</b> All India Radio Voice of Med. (Malta)
<b>0700 UTC</b> <u>(2:00 AM EST, 11:00 PM PST)</u> BBC	<b>0930</b> FEBC (Philippines) Radio Moscow Radio Netherlands Int'l Radio New Zealand Int'l [T]	<b>1115</b> Korean World News Service	<b>1310</b> Radiobrás [M-F]	<b>1453</b> Radio France Int'l [T/A]
Christian Science Monitor Radio Australia Radio Ghana Radio Japan Radio Moscow Radio Moscow (na) Vatican Radio [M-A] Voice of Myanmar (Burma) WWCR #1 [S]	<b>0931</b> Christian Science Monitor [M-F]	<b>1125</b> WYFR (Satellite Network) [M-A]	<b>1315</b> Radio Nepal	<b>1455</b> All India Radio
<b>0703</b> Radio Pyongyang Voice of Free China	<b>0933</b> Radio New Zealand Int'l [M]	<b>1130</b> Radio Finland [M-A] Radio Moscow Radio Nacional de Venezuela [M-A] Radio Netherlands Int'l Voice of Asia	<b>1324</b> HCJB [M-F]	<b>1500 UTC</b> <u>(10:00 AM EST, 7:00 AM PST)</u> BBC
<b>0710</b> Radio Australia [W]*	<b>0940</b> Voice of Greece	<b>1131</b> Christian Science Monitor [M-F]	<b>1328</b> Radio Cairo	BBC (af) [M-F] Channel Africa China Radio Int'l Christian Science Monitor Deutsche Welle Radio Australia Radio Canada Int'l [S] Radio Japan Radio Moscow Radio Omdurman Swiss Radio Int'l Voice of America (as, eu)
<b>0730</b> BBC (af) [A]* HCJB Radio Moscow Radio Moscow (na) [H-T] Radio Netherlands Int'l Radio Vlaanderen Int'l	<b>0945</b> Deutsche Welle [M-F]* Radio Yerevan [S]	<b>1133</b> Radio Bulgaria	<b>1330</b> All India Radio FEBC (Philippines) Korean World News Service Radio Austria Int'l Radio Canada Int'l [A-S] Radio Dubai Radio Finland [M-A] Radio Moscow [M-A] Radio Netherlands Int'l Radio Sweden [M-F] Radio Tashkent Radio Vlaanderen Int'l [S] Radio Yugoslavia Voice of America (as) (SE) Voice of Turkey Voice of Vietnam	<b>1503</b> Radio Pyongyang
<b>0731</b> Christian Science Monitor [M-F] Radio Moscow (na) [W]	<b>0955</b> Radio Japan [M-F]	<b>1135</b> Radio Thailand	<b>1331</b> Christian Science Monitor [M-F]	<b>1508</b> China Radio Int'l*
<b>0755</b> Radio Japan [M-F]	<b>1000 UTC</b> <u>(5:00 AM EST, 2:00 AM PST)</u> BBC	<b>1145</b> Deutsche Welle [S-F]*	<b>1335</b> Voice of Greece	<b>1525</b> BBC (af) [S]* Radio Veritas [T-F]
<b>0800 UTC</b> <u>(3:00 AM EST, 12:00 AM PST)</u> BBC	China Radio Int'l Christian Science Monitor FEBC (Philippines) [M-F]* HCJB Radio Australia Radio Moscow Radio New Zealand Int'l [A-S]	<b>1200 UTC</b> <u>(7:00 AM EST, 4:00 AM PST)</u> BBC	<b>1400 UTC</b> <u>(9:00 AM EST, 6:00 AM PST)</u> All India Radio [M/W/F] BBC	<b>1529</b> Deutsche Welle [F]*

## Thank You...

Additional contributors to this month's Shortwave Guide:

Bob Fraser, Cohasset, MA; Don Ferguson, VOA; Manual Rodriguez Lanza, Venezuela; Robert E. Thomas, Bridgeport, CT; John Babbis, Silver Springs, MD; Larry Van Horn, Brasstown, NC; Frank Hillton, Charleston, SC; Gerald G. Witham, Keaau, HI; Clyde W. Harmon, Anniston, AL; *Fine Tuning*, NASWA Journal, SPEEDX, BBC Summary of World Broadcasts, Internet, Grove BBS.

China Radio Int'l  
Christian Science Monitor  
Radio Australia  
Radio Korea  
Radio Moscow  
Radio New Zealand Int'l  
Radio Norway Int'l [S]  
Radio Tashkent [F-W]  
Radio Thailand  
Voice of America (as)  
WYFR (Satellite Network) [M-A]  
**1203**  
HCJB [M-F]  
**1208**  
China Radio Int'l\*

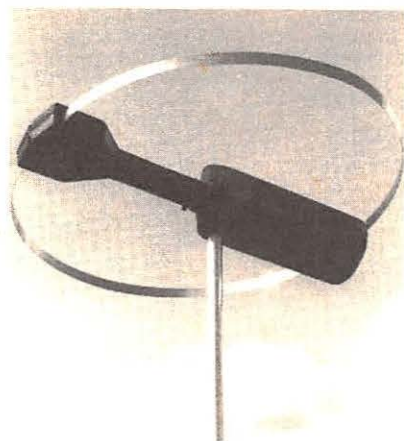
Radio Veritas [A-M]  
**1530**  
Deutsche Welle [M-H]\*  
FEBC (Philippines)  
Radio Austria Int'l  
Radio Finland [M-F]  
Radio Moscow  
Radio Netherlands Int'l  
Radio Portugal Int'l [M-F]  
Voice of Greece [M-A]  
**1531**  
Christian Science Monitor [M-F]  
**1540**



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This is the one that gives you freedom of speech, whether you have to deal with restrictive covenants at home or in your apartment or condo, or if you are traveling in your boat, car, or RV. It features 150 watts, continuous coverage from 10 to 30 MHz, narrow bandwidth to suppress out-of-band signals. The IsoLoop antenna comes fully assembled with no mechanical joints. There is simply no better value in antennas!



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**1545**  
Korean World News Service  
**1555**  
Radio Veritas [A-M]

## **1600 UTC** **(11:00 AM EST, 8:00 AM PST)**

BBC  
Channel Africa  
China Radio Int'l  
Christian Science Monitor  
Czech Republic  
Deutsche Welle  
Radio Australia  
Radio Canada Int'l [S]  
Radio France Int'l  
Radio Korea  
Radio Moscow  
Radio Pakistan  
Radio Tanzania  
Voice of America (af, as, eu)  
Voice of Kenya  
WHRI #2 [A]  
**1608**  
China Radio Int'l\*  
**1609**  
BBC\*  
**1630**  
HCJB [S-F]  
Radio Austria Int'l  
Radio Canada Int'l  
Radio Dubai  
Radio Moscow  
Voice of America (as, eu) (SE)  
**1631**  
Christian Science Monitor [M-F]  
**1650**  
WYFR (Satellite Network) [M-A]  
**1652**  
Radio France Int'l [M-F]

## **1700 UTC** **(12:00 PM EST, 9:00 AM PST)**

BBC  
BBC (af)  
Channel Africa  
China Radio Int'l  
Christian Science Monitor [M-A]  
Radio Australia  
Radio Japan  
Radio Moscow  
Radio New Zealand Int'l [M-F]\*  
Radio Pakistan  
RTM Morocco [A]  
Swiss Radio Int'l  
Voice of America (af)  
Voice of America (as)  
Voice of America (eu)  
WWCR #1 [M-F]  
**1703**  
Radio Pyongyang  
**1708**

China Radio Int'l\*  
**1710**  
Radio Australia\*  
**1715**  
Korean World News Service  
Radio Sweden [M-F]  
**1725**  
Radio New Zealand Int'l [M-F]\*  
**1730**  
Radio Moscow [S-H]  
Radio Netherlands Int'l  
Radio Romania Int'l  
Vatican Radio [F]  
Voice of America (af) [A-S]  
**1731**  
Christian Science Monitor [M-F]  
**1740**  
BBC (af)\*  
**1745**  
All India Radio

## **1800 UTC** **(1:00 PM EST, 10:00 AM PST)**

All India Radio  
BBC  
Channel Africa  
Christian Science Monitor  
Israel Radio Int'l  
Polish Radio  
Radio Australia  
Radio Moscow  
Radio New Zealand Int'l [M-F]  
Radio Norway Int'l [S]  
Radio Tanzania  
Voice of America (af)  
Voice of America (eu)  
Voice of Kenya  
WHRI #1 [M-F]  
WWCR #1, #3 [M-F]  
**1830**  
Radio Finland [S-F]  
Radio Kuwait [M/H/A]  
Radio Moscow  
Radio Nacional de Venezuela [M-A]  
Radio Netherlands Int'l  
Radio Sweden [M-F]  
Voice of America (af) [A-S] SE  
Voice of America (eu) SE  
**1831**  
Christian Science Monitor [M-F]  
**1833**  
Radio Bulgaria  
**1840**  
Radio New Zealand Int'l [T/W/H]\*  
**1853**  
Voice of Greece [M-A]  
Channel Africa [A]  
**1857**  
BBC (af) [M-F]\*

## **1900 UTC** **(2:00 PM EST, 11:00 AM PST)**

All India Radio [W]  
BBC  
BBC (af) [M-F]  
Channel Africa  
China Radio Int'l  
Christian Science Monitor [M-A]  
Deutsche Welle  
HCJB  
Radio Australia  
Radio Japan  
Radio Moscow  
Radio New Zealand Int'l [S-F]  
Radio Portugal Int'l [M-F]  
Radio Riga Int'l [A-S]  
Radio Romania Int'l  
Radio Vlaanderen Int'l  
Spanish National Radio  
Voice of America (af) [S-F]  
Voice of America (as, eu)  
WHRI #1 [M-F]  
WWCR #3 [M-A]  
**1903**  
Radio Bulgaria [M/H]  
**1908**  
China Radio Int'l\*  
**1910**  
All India Radio [W]  
Radio Australia [M-F]\*  
**1930**  
BBC (af) [S]\*  
Deutsche Welle [T-F]\*  
Radio Austria Int'l  
Radio Moscow  
Radio Netherlands Int'l  
Voice of America (af) [S]  
**1931**  
Christian Science Monitor [M-F]  
**1933**  
Deutsche Welle [M]\*  
**1935**  
RAI Italy  
**1945**  
Radio Yerevan

## **2000 UTC** **(3:00 PM EST, 12:00 PM PST)**

BBC  
Channel Africa  
China Radio Int'l  
Christian Science Monitor  
Israel Radio Int'l  
KVOH [A-S]  
Radio Australia  
Radio For Peace Int'l [A]  
Radio Moscow  
Radio New Zealand Int'l [S-F]  
Radio Norway Int'l [S]  
Radio Portugal Int'l [M-F]  
Swiss Radio Int'l  
Voice of America (af, eu)

Voice of Greece [M-A]  
Voice of Indonesia  
WWCR #3 [M-A]  
**2003**  
Radio Pyongyang  
**2008**  
China Radio Int'l\*  
**2011**  
Israel Radio Int'l [W]\*  
**2024**  
Israel Radio Int'l [T]  
**2025**  
RAI Italy  
**2028**  
Israel Radio Int'l [M]  
**2030**  
HCJB [M-A]  
Polish Radio  
Radio Korea  
Radio Moscow  
WWCR #3 [M-F]  
**2031**  
Christian Science Monitor [M-F]  
**2045**  
All India Radio [A]  
Korean World News Service  
**2055**  
Radio New Zealand Int'l [M-T-H]\*  
Voice of Indonesia [M]

## **2100 UTC** **(4:00 PM EST, 1:00 PM PST)**

All India Radio  
BBC  
China Radio Int'l  
Christian Science Monitor  
Deutsche Welle  
KVOH [A-S]  
Radio Australia  
Radio Damascus [F]  
Radio Havana Cuba [M-A]  
Radio Japan  
Radio Moscow  
Radio New Zealand Int'l [S-F]  
Radio Romania Int'l  
Radio Ukraine Int'l  
Spanish National Radio  
Voice of America (af, as, eu)  
Voice of Turkey  
WWCR #3 [M-F]  
**2103**  
Radio Bulgaria  
**2108**  
China Radio Int'l\*  
**2110**  
Radio Damascus [S-M]  
**2112**  
Radio Damascus [F]  
**2115**  
BBC (ca) [M-F]\*  
Radio Finland [S]  
**2120**  
Radio Cairo  
**2130**  
Radio Cairo [M]  
Radio Canada Int'l  
Radio Finland [M-F]  
Radio Moscow [S]  
Radio Nacional de Venezuela [M-A]  
Radio Riga Int'l [M-F]  
Radio Sweden [M-F]  
**2131**  
Christian Science Monitor [M-F]  
Radio Havana Cuba [M-W/F]  
**2145**  
Radio Damascus [W]  
Radio Korea

## **2200 UTC** **(5:00 PM EST, 2:00 PM PST)**

All India Radio [F-W]  
BBC  
China Radio Int'l  
Christian Science Monitor  
Czech Republic

Radio Australia  
Radio Budapest Int'l  
Radio Havana Cuba [M-H/A]  
Radio Korea  
Radio Moscow  
Radio New Zealand Int'l  
Radio Tirana  
Radio Vlaanderen Int'l [M-F]  
Radio Yugoslavia  
RAI Italy  
Swiss Radio Int'l  
Voice of America (as)  
WWCR #3 [A]  
**2203**  
Voice of Free China  
**2208**  
China Radio Int'l\*  
**2209**  
BBC\*  
**2215**  
All India Radio [M/F]  
Radio Cairo  
**2230**  
Israel Radio Int'l  
Radio Havana Cuba [H]  
Radio Havana Cuba [M/H]\*  
Radio Moscow [S-F]  
Radio Sweden [M-F]  
Voice of America (as) SE  
**2231**  
Christian Science Monitor [M-F]  
**2240**  
Radio Cairo  
Voice of Greece [S-F]  
**2242**  
Israel Radio Int'l [H]\*  
**2245**  
Radio Yerevan  
**2248**  
Radio Bulgaria  
**2253**  
Israel Radio Int'l [T]  
**2257**  
Israel Radio Int'l [M]  
**2258**  
Israel Radio Int'l [S]

## **2300 UTC** **(6:00 PM EST, 3:00 PM PST)**

BBC  
Christian Science Monitor [M-A]  
Radio Australia  
Radio Canada Int'l  
Radio Japan  
Radio Moscow  
Radio New Zealand Int'l  
Radio Norway Int'l [S]  
Radio Vilnius [F]\*  
Radio Vilnius [M-H]  
Voice of America (as)  
Voice of Turkey  
WWCR #3 [M-F]  
**2303**  
Radio Pyongyang  
**2305**  
Radio Vilnius [F]\*  
**2330**  
Radio Austria Int'l  
Radio Moscow [F-T/W]  
Radio Netherlands Int'l  
Radio Sweden [M-F]  
SLBC (Sri Lanka) [M]  
**2331**  
Christian Science Monitor [M-F]  
**2335**  
Voice of Greece [S-F]  
**2340**  
Radio Yerevan  
**2355**  
Radio Japan [W-F]

## Donald Duck on Shortwave Radio

There are a few shortwave broadcasters who experiment from time to time with broadcasting on single sideband instead of AM mode. They do this to avoid adjacent-channel interference, jamming, to boost an otherwise weak signal, or to get the most efficient use out of their transmit power.

In a single sideband transmission, you will be able to hear the voice, but can't quite tune it in to make it understandable. Try switching your receiver to SSB or USB (the button on my Uniden 2021 just says "CW"), and fine tune to see if you can clear up the voice.

Radio for Peace International has used upper side band consistently on 7375 kHz (0000-1400 UTC) and 21465 kHz (1400-0000 UTC). To learn to recognize the sound, tune in one of those frequencies in AM mode, then switch to USB and practice zeroing in on the signal. Other stations which have experimented with USB include HCJB, Radio Havana, Radio Sweden, and some clandestine or low-budget stations.

MT occasionally receives requests to add information such as sideband and transmission sites to the frequency section, but we regret it simply is not possible without rewriting the computer program, using many more pages, and turning the manager into a full-time position! We recommend you buy a copy of *Passport to World Band Radio* or *World Radio TV Handbook*, whose staffs spend the entire year compiling such information, or write directly to the stations in which you are interested for a more detailed schedule of their programs, frequencies and relay sites.



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0000 UTC

**[7:00 PM EST/4:00 PM PST]**

## FREQUENCIES

0000-0100	Australia, ABC Brisbane	4920do	9660do					15425am	15470am	17570as	17590as
0000-0100	Australia, ABC Perth	9610do						17720na	17860as	21625na	21690na
0000-0100	Australia, Radio	13605as	15320as	15365pa	15510as	0000-0100	Singapore, SBC Radio One	5010do	5052do	11940do	
		17750as				0000-0100	Spain, Spanish Natl Radio	9525na			
0000-0100 vl	Australia, VL8A Alice Spg	4835do				0000-0030	Sweden, Radio	9695sa			
0000-0100 vl	Australia, VL8K Katherine	5025do				0000-0030	Switzerland, Swiss R Intl	6135na	9650na	9885na	12035na
0000-0100 vl	Australia, VL8T Tent Crk	4910do						17730na			
0000-0025	Belguim, R Vlaanderen Int	7370na				0000-0100	Thailand, Radio	4830as	9655as	11905as	
0000-0015	Bulgaria, Radio	9700na	11720na			0000-0100	United Kingdom,BBC London	5975na	6175na	7180eu	7325na
0000-0015	Cambodia, Natl Voice of	11938as						9590na	9915na	11750sa	15260sa
0000-0100	Canada, CFCX Montreal	6005do				0000-0100	USA, CSMonitor Boston MA	5850na	13760sa	17865as	
0000-0100	Canada, CFRX Toronto	6070do				0000-0100 sa	USA, CSMonitor Boston MA	17865as			
0000-0100	Canada, CFVP Calgary	6030do				0000-0100	USA, KCBi Dallas TX	15725am			
0000-0100	Canada, CHNX Halifax	6130do				0000-0100	USA, KTVN Salt Lk City UT	15590am			
0000-0100	Canada, CKZU Vancouver	6160do				0000-0100	USA, KVOH Los Angeles CA	17775am			
0000-0100	China, China Radio Intl	9770na	11715na			0000-0100	USA, VOA Washington DC	5995sa	6130sa	7215as	7405sa
0000-0100	Costa Rica, AWR Alajuela	9725ca	11870ca					9455ca	9770as	9775ca	11580sa
0000-0100	Costa Rica, R Peace Intl	7375am	7385am	21465am				11695sa	11760as	15120sa	15185as
0000-0100	Cuba, Radio Havana Cuba	6010na						15205sa	15250as	15290as	17735as
0000-0030	Czech Republic, R Prague	5930na	7345na	9485na	9810na			17820as			
		11990na	13715na	17535na		0000-0100	USA, WEWN Birmingham AL	7425na	13710na		
0000-0045	India, All India Radio	9910as	11745as	11785as	15110as	0000-0100	USA, WINB Red Lion PA	15145eu			
		15145as				0000-0100	USA, WJCR Upton KY	7490na	13595na		
0000-0100 irreg	Iraq, Radio Iraq Intl	15180am	17940am			0000-0100	USA, WRNO New Orleans LA		7355na		
0000-0100	Lebanon, King of Hope	6280me				0000-0100	USA, WWCR Nashville TN	5810am	7435am	13845am	
0000-0100 mtwhf	Lebanon, Wings of Hope	11530me				0000-0100	USA, WYFR Okeechobee FL	6085na			
0000-0100 vl	Malaysia, RTM Kota Kinaba	5980do				0010-0015	Kirghizia, Kirghiz Radio	6080as			
0000-0100 vl	Malaysia, RTM Sarawak	4950do	7160do			0030-0100	Australia, Radio	11720pa	11800pa	15240as	17715pa
0000-0100	New Zealand, R NZ Intl	15120pa						17795pa	17880as	21740pa	
0000-0050	North Korea, R Ponggyang	11335na	13760na	15130na		0030-0055	Belgium, R Vlaanderen Int	7370na	9930na		
0000-0030 m	Norway, Radio Norway Intl	9675na	11925sa			0030-0100	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0000-0100 mtwhfa	Palau, KHBN Voice of Hope	11980as				0030-0100	Iran, VOIRI Tehran	9022am	11790am	15260am	
0000-0100	Philippines, FEBC Manila	15450as				0030-0100	Netherlands, Radio	6020na	6165na	7305as	9840na
0000-0100 vl	PNG, Natl BC	4890do						9860as	11655na		
0000-0100	Russia, Radio Moscow Intl	7205am	7335am	9750am	9860na	0030-0100	Sri Lanka, SLBC Colombo	6005as	9720as	15425as	
		11685am	11790am	11960as	11970as						
		12015me	12050me	13775as	15375am						

## SELECTED PROGRAMS

**Sundays**

- 0010 Radio Australia: Study in Australia. Exploring educational opportunities in Australia.
- 0010 VOA (as): VOA Monday Morning. News closeups in a magazine format.
- 0010 VOA (am): Agriculture Today. A weekly program about food, farming, and agricultural research.
- 0030 BBC: Play of the Week. "Our Town" (14th). A classic of American theater.
- 0030 BBC: The John Dunn Show. A melodic mix of songs old and new.
- 0030 Radio Australia: Correspondents' Report. NEW! In-depth reports from around the world on a variety of topics.
- 0040 VOA (as, am): Words and Their Stories (SE). The origin and use of common words and phrases in American English.
- 0045 VOA (as): Tuning in the USA (SE). A program designed for those learning to speak English.

## Mondays

- 0000 Radio Australia: Network asia (Part 1). NEW! Brian Abbott  
hosts this program of news, interviews, current affairs, and  
developments in the asian/Pacific region.  
0000 Radio Bulgaria: Timeout for Music. See S 2356.  
0010 VOA (as): Newslne. News, correspondent reports, inter  
views, and opinion.  
0010 VOA (am): Encounter. A discussion program presenting  
opinions on the issues facing America and the world.  
0030 BBC: In Praise of God. Weekly programme of worship and  
meditation.  
0030 Radio Australia: International Report. NEW! Twenty minutes  
of information and comment on the half-hour every two hours.  
0040 VOA (as): Development Report (SE). Helpful information for

SE = Special English, easy to understand

- VOA (am): Development Report (SE). Helpful information for developing nations.  
VOA (as, am): This is America (SE). See S 1645.

## Tuesdays

- 0000 Radio Australia: Network asia (Part 1). See M 0000.  
0000 Radio Bulgaria: Timeout for Music. See S 2356.  
0010 VOA (as): Newslne. See M 0010.  
0010 VOA (am): Newslne. News, correspondent reports, inter  
views, and opinion.  
0030 Radio Australia: International Report. See M 0030.  
0040 VOA (as, am): Development Report (SE). See M 0040.  
0045 VOA (as, am): This is America (SE). See S 1645.

### Wednesdays

- 0000 Radio Australia: Network asia (Part 1). See M 0000.  
0000 Radio Bulgaria: Radio Bulgaria Calling. See S 2341.  
0010 VOA (as, am): Newslines. See M 0010.  
0030 BBC: Omnibus. Each week a half-hour programme on practically any topic under the sun.  
0030 Radio Australia: International Report. See M 0030.  
0040 VOA (as, am): Science Report (SE). Developments in the world of science and technology.  
0045 VOA (as, am): Space and Man (SE). Reports about outer space or about the human body.

### Thursdays

- 0000 Radio Australia: Network asia (Part 1). See M 0000.  
0000 Radio Bulgaria: Folk Studio. See W 2345.  
0010 VOA (as, am): Newslines. See M 0010.  
0030 BBC: Feature. See W 1530.

- 0030 Radio Australia: International Report. See M 0030.  
0040 VOA (as, am): Science Report (SE). See W 0040.  
0045 VOA (as, am): The Making of a Nation (SE). Chapters from  
U.S. history in special English.

## Fridays

- 0000 Radio Australia: Network asia (Part 1). See M 0000.  
0000 Radio Bulgaria: Folk Studio. See W 2345.  
0010 VOA (as, am): Newsline. See M 0010.  
0030 BBC: Music Feature. "Tchaikovsky". This series marks the  
centenary of the composer's death in 1893.  
0030 Radio Australia: International Report. See M 0030.  
0040 VOA (as, am): Science Report (SE). See W 0040.  
0045 VOA (as): VOA Friday Morning. See S 0010.  
0045 VOA (am): The Making of a Nation (SE). See H 0045.

**Saturdays**

- 0000 Radio Bulgaria: Radio Bulgaria Calling. See S 2341.  
0010 Radio Australia: Feedback. See S 0410.  
0010 VOA (as, am): Newswire. See M 0010.  
0030 BBC: From the Weeklies. Review of the British weekly press.  
0030 Radio Australia: Indian Pacific. NEW! Weekly program of news and analysis of events in the Pacific and Asia.  
0040 VOA (as): In the News (SE). Focus on a person, organization, or issue in news reports.  
0040 VOA (am): Environment Report (SE). A five-minute report on a specific environmental subject.  
0045 BBC: The Learning World. See M 0615.  
0045 VOA (as): VOA Saturday Morning. See S 0010.  
0045 VOA (am): American Mosaic (SE). Reports about music, books, movies, and student life in the U.S.A.



## 0100 UTC

**[8:00 PM EST/5:00 PM PST]**

## FREQUENCIES

0100-0200	Australia, ABC Brisbane	4920do	9660do		
0100-0200	Australia, ABC Perth	9610do			
0100-0200	Australia, Radio	11720pa	11800pa	15240as	15320pa
		15365pa	15510as	17715pa	17750as
		17795pa	17880as	21740pa	
0100-0200 vl	Australia, VL8A Alice Spg	4835do			
0100-0200 vl	Australia, VL8K Katherine	5025do			
0100-0200 vl	Australia, VL8T Tent Crk	4910do			
0100-0200	Bulgaria, Radio	7455eu	9700na		
0100-0200	Canada, CFCX Montreal	6005do			
0100-0200	Canada, CFRX Toronto	6070do			
0100-0200	Canada, CFVP Calgary	6030do			
0100-0200	Canada, CHNX Halifax	6130do			
0100-0200	Canada, CKZU Vancouver	6160do			
0100-0200	Costa Rica, R Peace Intl	7375am	7385am	21465am	
0100-0200	Cuba, Radio Havana Cuba	6010na			
0100-0130	Czech Republic, R Prague	7345na	9485na	9810na	11990na
		17535na			
0100-0200	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0100-0150	Germany, Deutsche Welle	6040na	6085na	6145na	9700na
		9765na	11865na	15105na	
0100-0200 mwf	Guam, KSDA AWR Agat	15610as			
0100-0200	Indonesia, Voice of	9675na	11752na		
0100-0130	Iran, VOIRI Tehran	9022am	11790am	15260am	
0100-0120	Italy, RAI Rome	6005na	9575na	11800na	
0100-0200	Japan, NHK/Radio Japan	5960na	11860as	15195as	17775as
		17810as	17845as		
0100-0130	Laos, National Radio of	7116as			
0100-0200	Lebanon, King of Hope	6280me			
0100-0200	Namibia, Namibia BC Corp	3290af			
0100-0200	New Zealand, R NZ Intl	15120pa			
0100-0200	Philippines, FEBC Manila	15450as			
0100-0200 vl	PNG, Natl BC	4890do			
0100-0200	Russia, Radio Moscow Intl	7205af	7335af	9750am	9860am
		11685as	11960as	11970as	12015as
		13775am	15375am	15425am	15475am
		17560am	17570na	17590na	17720na
		17860na	21625na		

0100-0130	Serbia, Radio Yugoslavia	9580eu	11870na		
0100-0200	Singapore, SBC Radio One	5010do	5052do	11940do	
0100-0127	Slovakia, R Slovakia Intl	5930na	9810na		
0100-0200	South Korea, Radio Korea	7550eu	15575am		
0100-0200	Spain, Spanish Natl Radio	9525na			
0100-0200	Sri Lanka, SLBC Colombo	6005as	9720as	15425as	
0100-0130	Sweden, Radio	9695as	11820as		
0100-0200	Thailand, Radio	4830as	9655as	11905as	
0100-0200	Ukraine, R Ukraine Intl	6070eu	6090eu	7150eu	7195eu
		7240eu	9550eu	9640eu	9860na
		11720na	15195na	17605na	17690na
0100-0200	United Kingdom, BBC London	5975na	6175na	6175na	7325na
		9590na	9915na	11750sa	15260sa
		15310as			
0100-0200	USA, CSMonitor Boston MA	5850na	13760sa	17865as	
0100-0200 sa	USA, CSMonitor Boston MA	17865as			
0100-0200	USA, KCBI Dallas TX	15725am			
0100-0200	USA, KTVN Salt Lk City UT	7510na			
0100-0200	USA, KVOH Los Angeles CA	17775am			
0100-0200	USA, VOA Washington DC	5995sa	6130sa	7115as	7205as
		7405sa	9455ca	9775as	11580sa
		11705as	15120sa	15160sa	15205sa
		15250as	17740as	21550sa	
0100-0130	USA, WEWN Birmingham AL	7425as			
0100-0200	USA, WINB Red Lion PA	15145na			
0100-0200	USA, WJCR Upton KY	7490na	13595na		
0100-0200	USA, WRNO New Orleans LA	7355na			
0100-0200	USA, WWCR Nashville TN	5810am	7435am	13845am	
0100-0200	USA, WYFR Okeechobee FL	6065na	9505na	15440na	
0100-0130	Uzbekhistan, R Tashkent	7285as	9715as	15295as	17815as
0130-0200	Albania, R Tirana Intl	9580na	11840na		
0130-0200	Austria, R Austria Intl	9655na	9870sa	13730sa	
0130-0150 mtwhfa	Greece, Voice of	9380na	9420na	11645na	
0130-0200	Netherlands, Radio	9845as	9860as	11655as	
0130-0200 mtwhf	Portugal, Radio	9555na	9570na	9600na	9705na
		11840na			
0130-0200	USA, WHRI Noblesville IN	7315am			
0145-0200 smtwhf	Finland, Radio	11755na	15185na		
0145-0200	Vatican State, Vatican R	7125oa	9650as		

## SELECTED PROGRAMS

### Sundays

- 0101 BBC: Play of the Week. "Night, Mother" (7th); "The Lady's  
Not for Burning" (28th); "The Woods" (21st).  
0110 Radio Australia: Book Reading. Serialized readings.  
0110 VOA (as): VOA Monday Morning. See S 0010.  
0115 Radio Bulgaria: Lifestyle. Bulgarian culture.  
0130 Radio Australia: The Europeans. NEW! European issues.  
0130 Radio Bulgaria: From School to Campus. Secondary education  
and talent movement in Bulgaria.  
0130 VOA (am): Press Conference U.S.A..  
0145 Radio Bulgaria: Religion. An historical look at religion.

### Mondays

- 0100 Radio Australia: Network Asia (Part 2). See S 2300.  
0101 BBC: Special Feature. "Dot, Dot, Dash" (1st). Shorthand.  
0101 BBC: NEW! Special Feature. "Great Political Speeches" of  
the '60s (8th,15th).  
0110 VOA (as): Newline. See M 0010.  
0110 VOA (am): New Horizons. Science and technology.  
0115 Radio Bulgaria: Across the Map of Bulgaria. Historical sites.  
0120 Radio Australia: Sports Report. See S 1310.  
0130 VOA (as): VOA Tuesday Morning. See S 0010.  
0130 VOA (am): Issues in the News. The Washington press corps  
discuss current topics.  
0145 BBC (as): South Asia Report. See S 0315.  
0145 BBC: Music Feature. "Capriccio" (29th).  
0145 Radio Bulgaria: Radio Bulgaria Calling. See S 2341.

## Tuesdays

- 0100 Radio Australia: Network Asia (Part 2). See S 2300.  
0105 BBC: Outlook. See M 1405.  
0110 VOA (as): Newslne. See M 0010.  
0110 VOA (am): Report to the Americas. Regional news and  
roundup of sports, financial news, and weather.

- 0115 Radio Bulgaria: Review of Current Affairs. See S 0415.  
0120 Radio Australia: Sports Report. See S 1310.  
0130 BBC: Folk Routes. Ian Anderson cajun to blues.  
0130 Radio Bulgaria: Business and Finance. See M 2315.  
0130 VOA (as): VOA Wednesday Morning. See S 0010.  
0145 BBC (as): South Asia Report. See S 0315.  
0145 BBC: Health Matters. Keeps track of new developments.  
0145 Radio Bulgaria: Sports Roundup. See M 2330.  
0155 VOA (am): VOA Editorial. U.S. position.

### Wednesdays

- 0100 Radio Australia: Network Asia (Part 2). See S 2300.  
0105 BBC: Outlook. See M 1405.  
0110 VOA (as): Newsline. See M 0010.  
0110 VOA (am): Report to the Americas. See T 0110.  
0115 Radio Bulgaria: Review of Current Affairs. See S 0415.  
0120 Radio Australia: Sports Report. See S 1310.  
0130 BBC: Feature: "Changing Reputations" (3rd,10th). Schweitzer  
and Baden-Powell; "Homeward Bound" (17th,24th). American  
expatriot.  
0130 Radio Bulgaria: Answering Your Letters. See S 2315.  
0130 VOA (as): VOA Thursday Morning. See S 0010.  
0145 BBC (as): South Asia Report. See S 0315.  
0145 BBC: Country Style. With David Allan.  
0155 VOA (am): VOA Editorial. See T 0155.

Thursdays

- 0100 Radio Australia: Network Asia (Part 2). See S 2300.  
0105 BBC: Outlook. See M 1405.  
0110 VOA (as): Newsline. See M 0010.  
0110 VOA (am): Report to the Americas. See T 0110.  
0115 Radio Bulgaria: Review of Current Affairs. See S 0415.  
0120 Radio Australia: Sports Report. See S 1310.  
0130 Radio Bulgaria: Folk Studio. See W 2345.  
0130 VOA (as): VOA Friday Morning. See S 0010.

- 0140 BBC: Book Choice. See W 0425.  
0145 BBC (as): South Asia Report. See S 0315.  
0145 BBC: The Farming World. New developments.  
0155 VOA (am): VOA Editorial. See T 0155.

## Fridays

- 0100 Radio Australia: Network Asia (Part 2). See S 2300.  
0105 BBC: Outlook. See M 1405.  
0110 VOA (as): Newslines. See M 0010.  
0110 VOA (am): Report to the Americas. See T 0110.  
0115 Radio Bulgaria: Review of Current Affairs. See S 0415.  
0120 Radio Australia: Sports Report. See S 1310.  
0130 BBC: On the Move, Travel with Malcolm Billings.  
0130 Radio Bulgaria: Mosaical Facts about Bulgaria. See T 2341.  
0130 VOA (as): VOA Saturday Morning. See S 0010.  
0145 BBC (as): South Asia Report. See S 0315.  
0145 BBC: Global Concerns. Update on environmental issues.  
0145 Radio Bulgaria: Women's Magazine. The hardships and achievements of Bulgarian women.  
0155 VOA (am): VOA Editorial. See T 0155.

### Saturdays

- 0105 BBC: Outlook. See M 1405.  
0110 Radio Australia: Jazz Notes. See T 1330.  
0110 VOA (as): VOA Sunday Morning. See S 0010.  
0110 VOA (am): Report to the Americas. See T 0110.  
0115 Radio Bulgaria: Review of Current Affairs. See S 0415.  
0130 BBC: Feature (6th). See S 0430.  
0130 BBC: Short Story. See S 0430.  
0130 Radio Australia: Lane's Company. See S 1530.  
0145 BBC (as): South Asia Report. See S 0315.  
0145 BBC: Jazz Now and Then. George Reid presents a mix.  
0145 Radio Bulgaria: Timeout for Music. See S 2356.  
0155 VOA (am): VOA Editorial. See T 0155.



0200 UTC

[9:00 PM EST/6:00 PM PST]

## FREQUENCIES

0200-0300 twfha	Argentina, RAE	11710am			
0200-0300	Australia, ABC Brisbane	4920do	9660do		
0200-0300	Australia, ABC Perth	4910do	9610do	15425do	
0200-0300	Australia, Radio	11880pa	15320pa	15365pa	17715pa
		17750as	17795pa	17880as	21525as
		21595as	21740pa		
0200-0300 vl	Australia, VL8A Alice Spg	4835do			
0200-0300 vl	Australia, VL8K Katherine	5025do			
0200-0300 vl	Australia, VL8T Tent Crk	4910do			
0200-0300	Canada, CFCX Montreal	6005do			
0200-0300	Canada, CFRX Toronto	6070do			
0200-0300	Canada, CFVP Calgary	6030do			
0200-0300	Canada, CHNX Halifax	6130do			
0200-0300	Canada, CKZU Vancouver	6160do			
0200-0300	Canada, RCI Montreal	6120na	9535am	9755na	11845na
		11940am			
0200-0300	Canada, RCI Montreal	9535sa	11845sa	11940sa	
0200-0300	Costa Rica, R Peace Intl	7375am	7385am	21465am	
0200-0300	Cuba, Radio Havana Cuba	6010na			
0200-0230	Czech Republic, R Prague	7345na	9485me	11990af	13715af
		17535as			
0200-0300	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0200-0300	Egypt, Radio Cairo	9475na	11660na		
0200-0215 smtwhf	Finland, Radio	11755na	15185na		
0200-0250	Germany, Deutsche Welle	7285as	9615as	9690as	11945as
		11965as	13790as	15185as	15560as
0200-0300 as	Guam, KSDA AWR Agat	13720as			
0200-0300 vl	Italy, IRRS Milano	7125na			
0200-0230 mtwhfa	Kenya, Kenya BC Corp	4935do			
0200-0300 smtwh	Malaysia, RTM Radio 4	7295do			
0200-0300 vl	Mexico, Radio Educacion	6185am			
0200-0230	Myanmar, Radio	7185do			
0200-0300	Namibia, Namibia BC Corp	3290af			
0200-0300	New Zealand, R NZ Intl	15120pa			
0200-0230 m	Norway, Radio Norway Intl	6120na	7165as		
0200-0230	Philippines, FEBC Manila	15450as			
0200-0300 vl	PNG, Natl BC	4980do			
0200-0300	Romania, R Romania Intl	6155na	9510na	9570na	11830na
		11940na			
0200-0300	Russia, AWR Russia	11835eu			

0200-0300	Russia, Radio Moscow Intl	7205am	7335am	9750am	11970am
		13775as	15425am	17560am	17570am
		17590am	17720am	17860am	17870am
0200-0300	S Africa, Channel Africa	9730af			
0200-0230	Serbia, Radio Yugoslavia	9580na	11870na		
0200-0300	Singapore, SBC Radio One	5010do	5052do	11940do	
0200-0227	Slovakia, R Slovakia Intl	5930na	7310na	9810na	
0200-0300	Sri Lanka, SLBC Colombo	6005as	9720as	15425as	
0200-0230	Sweden, Radio	9695na	11705na		
0200-0230	Switzerland, Swiss R Intl	6135am	9650am	9885am	12035am
0200-0300	Taiwan, VO Free China	5950na	9680na	11740na	15345na
0200-0300	Thailand, Radio	4830as	9655as	11905as	
0200-0300	United Kingdom, BBC London	5975na	6175na	6195me	7135me
		7155me	9410eu	9590na	9630af
		9915am	11705sa	11730af	11750sa
		11955me	15260sa		
0200-0300	USA, CSMonitor Boston MA	5850na	13760ca		
0200-0300 sa	USA, CSMonitor Boston MA	17555as	17865as		
0200-0230	USA, KCBI Dallas TX	15375am			
0200-0300	USA, KTNB Salt Lk City UT	7510am			
0200-0230 twfha	USA, VOA Washington DC	5995sa	7115as	7405sa	9775ca
		11580sa	15120sa	15205sa	
0200-0300	USA, VOA Washington DC	7205as	11705as	15160sa	15250as
		17740as	21550sa		
0200-0300	USA, WHRI Noblesville IN	7315na			
0200-0300	USA, WINB Red Lion PA	15145eu			
0200-0300	USA, WJCR Upton KY	7490na	13595na		
0200-0300	USA, WWCR Nashville TN	5810am	5935am	7435am	
0200-0300	USA, WYFR Okeechobee FL	6065na	9505na	15440na	
0215-0255	Nepal, Radio	3230do	5005do	7165do	
0230-0245	Albania, R Tirana Intl	9580na	11840na		
0230-0300 s	Kenya, Kenya BC Corp	4935do			
0230-0300	Netherlands, Radio	9845as	9860as	11655as	
0230-0245	Pakistan, Radio	17705as	17725as		
0230-0300	Philippines, R Pilipinas	17760as	17840as	21580as	
0245-0300	Armenia, Radio Yerevan	10344na	11675na	11790na	13765na
		15330na			
0245-0300	United Kingdom, BBC London	6110sa	9515sa	9895sa	11965sa
		15390sa			
0250-0300	Vatican State, Vatican R	6095na	7305na	9605na	

## SELECTED PROGRAMS

## Sundays

- 0210 Radio Australia: Study in Australia. See S 0010.  
 0210 VOA (as): VOA Sunday Morning. See S 0010.  
 0230 BBC: Feature. "From Hoplite to Harrier" (7th). Conclusion of this feature on the history of warfare.  
 0230 BBC: Feature. "The Divine Supermarket" (28th). NEW! The story of emigration to America.  
 0230 BBC: Special Feature. "Kershaw in Cuba" (14th, 21st). NEW! Andy Kershaw visits this Caribbean outpost of communism.  
 0230 Radio Australia: Correspondents' Report. See S 0030.

## Mondays

- 0200 Radio Australia: Network Asia (Part 1). See M 0000.  
 0210 VOA (as): Newsline. See M 0010.  
 0230 BBC: Composer of the Month. In depth looks at Claudio Monteverdi and his music.  
 0230 Radio Australia: International Report. See M 0030.  
 0230 VOA (as): VOA Monday Morning. See S 0010.

## Tuesdays

- 0200 Radio Australia: Network Asia (Part 1). See M 0000.  
 0210 VOA (as): Newsline. See M 0010.  
 0210 Voice of America (am): Focus. The major figures and issues that shape our world.

- 0230 BBC: Quiz. See M 1215.  
 0230 Radio Australia: International Report. See M 0030.  
 0230 VOA (as): VOA Tuesday Morning. See S 0010.

## Wednesdays

- 0200 Radio Australia: Network Asia (Part 1). See M 0000.  
 0210 VOA (as): Newsline. See M 0010.  
 0210 Voice of America (am): Focus. See T 0210.  
 0230 BBC: Development '93. Aid and development issues.  
 0230 VOA (as): VOA Wednesday Morning. See S 0010.

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## Thursdays

- 0200 Radio Australia: Network Asia (Part 1). See M 0000.  
 0210 VOA (as): Newsline. See M 0010.  
 0210 Voice of America (am): Focus. See T 0210.  
 0230 BBC: Sports International. Live commentaries and interviews, features and discussions.  
 0230 Radio Australia: International Report. See M 0030.  
 0230 VOA (as): VOA Thursday Morning. See S 0010.

## Fridays

- 0200 Radio Australia: Network Asia (Part 1). See M 0000.  
 0210 VOA (as): Newsline. See M 0010.  
 0210 Voice of America (am): Focus. See T 0210.  
 0230 BBC: Drama. See H 1130.  
 0230 Radio Australia: International Report. See M 0030.  
 0230 VOA (as): VOA Friday Morning. See S 0010.

## Saturdays

- 0210 Radio Australia: Feedback. See S 0410.  
 0210 VOA (as): VOA Saturday Morning. See S 0010.  
 0210 Voice of America (am): Focus. See T 0210.  
 0230 BBC: People and Politics. Background to the British political scene.  
 0230 Radio Australia: Indian Pacific. See A 0030.



## 0300 UTC

[10:00 PM EST/7:00 PM PST]

## FREQUENCIES

0300-0400	Australia, AAF Radio	19037af	23678as		
0300-0400	Australia, ABC Brisbane	4920do	9660do		
0300-0400	Australia, ABC Perth	9610do			
0300-0400	Australia, Radio	11720pa	11880pa	15240pa	15320pa
		15365pa	17715pa	17750as	17795pa
		17880as	21525as	21595as	21740pa
0300-0400 vl	Australia, VL8A Alice Spg	4835do			
0300-0400 vl	Australia, VL8K Katherine	5025do			
0300-0400 vl	Australia, VL8T Tent Crk	4910do			
0300-0400	Bahrain, Radio	6010do			
0300-0400	Canada, CFCX Montreal	6005do			
0300-0400	Canada, CFRX Toronto	6070do			
0300-0400	Canada, CFVP Calgary	6030do			
0300-0400	Canada, CHNX Halifax	6130do			
0300-0400	Canada, CKZU Vancouver	6160do			
0300-0400	China, China Radio Intl	9690na	9770na	11715na	
0300-0400	Costa Rica, R Peace Intl	7375am	7385am	21465am	
0300-0400	Costa Rica, Faro del Carib	5055do			
0300-0400	Cuba, Radio Havana Cuba	6010na	6180na		
0300-0330	Czech Republic, R Prague	5930na	7345na	9485na	9810na
		11990na			
0300-0400	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0300-0330	Egypt, Radio Cairo	9475na	11660na		
0300-0350	Germany, Deutsche Welle	6085na	6145na	9640na	9700na
		11715na	13790na		
0300-0400	Guatemala, Radio Cultural	3300do			
0300-0400 sm	Honduras, R Luz y Vida	3250ca			
0300-0400	Hungary, Radio Budapest	9835na	11910na	15220na	
0300-0315 vl	Italy, IRRS Milano	7125na			
0300-0400	Japan, NHK/Radio Japan	11875na	15210am	15230am	15325am
		17810am	21610am		
0300-0400	Kenya, Kenya BC Corp	4935do			
0300-0400 mtwhf	Lebanon, Wings of Hope	11530me			
0300-0400 smtwh	Malaysia, RTM Radio 4	7295do			
0300-0400 vl	Mexico, Radio Educacion	6185am			
0300-0400	New Zealand, R NZ Intl	15120pa			
0300-0330 m	Norway, Radio Norway Intl	6115na			
0300-0330	Philippines, R Pilipinas	17760as	17840as	21580as	
0300-0400 vl	PNG, Natl BC	4890do			

0300-0400	Russia, Radio Moscow Intl	7205am	7335am	9710am	9750na
		9860am	9905na	11690na	11775na
		12050na	15425na	17605am	17860as
0300-0400	S Africa, Channel Africa	5960af	9730af		
0300-0400	Singapore, SBC Radio One	5010do	5052do	11940do	
0300-0400	Sri Lanka, SLBC Colombo	9720as	15425as		
0300-0400	Taiwan, VO Free China	5950na	9680na	9765as	11740as
0300-0400	Tanzania, Radio	5985af	9685af	11765af	
0300-0400	Thailand, Radio	9655as	11905as		
0300-0400 vl	Uganda, Radio	4976do			
0300-0330	United Kingdom, BBC London	6175na	7155me	11750sa	15260sa
		15310as	15380as		
0300-0400	United Kingdom, BBC London	3255af	5975na	6180eu	6195eu
		7230eu	9410eu	9600af	11760me
		11955me	12095ca	15310me	15420af
		21715as			
0300-0400	USA, CSMonitor Boston MA	7465eu			
0300-0400 sa	USA, CSMonitor Boston MA	17555as	17865as		
0300-0400	USA, KCB Dallas TX	13720am			
0300-0400	USA, KTN Salt Lk City UT	7510am			
0300-0400	USA, KVOH Los Angeles CA	9785sa			
0300-0400	USA, VOA Washington DC	6065af	7265af	7280af	7405af
		9575af	9885af		
0300-0400	USA, WEWN Birmingham AL	7425na			
0300-0400	USA, WHRI Noblesville IN	7315na			
0300-0400	USA, WJCR Upton KY	7490na	13595na		
0300-0400	USA, WRNO New Orleans LA	7395am			
0300-0400	USA, WWCR Nashville TN	5810am	5935am	7435am	
0300-0400	USA, WYFR Okeechobee FL	6065na	9505na		
0300-0308	Vatican State, Vatican R	6095na	7305na	9605na	
0330-0400	Austria, R Austria Intl	9870sa	13730sa		
0330-0400	Netherlands, Radio	6165na	9590na		
0330-0400	UAE, UAE Radio Dubai	11945na	13675na	15400eu	17890eu
		21485na			
0340-0350 mtwhfa	Greece, Voice of	9380na	9420na	11645na	
0345-0400	Tajikistan, Radio	7245eu			

## SELECTED PROGRAMS

## Sundays

- 0310 Radio Australia: Book Reading. See S 0110.  
 0315 BBC (as): South Asia Report. Regional daily current affairs program.  
 0315 BBC: Sports Roundup. The latest sports news.  
 0330 BBC: From Our Own Correspondent. BBC correspondents comment on the background to the news.  
 0330 Radio Australia: At Your Request. Dick Paterson plays requests and dedications.  
 0335 BBC (af): Postmark Africa. Expert answers to any question under the sun.  
 0350 BBC: Write On. Air your views about World Service: write to PO Box 76, Bush House, Strand, London WC2B 4PH.

## Mondays

- 0300 Radio Australia: Network Asia (Part 2). See S 2300.  
 0310 Radio Australia: Sports Report. See S 1310.  
 0315 BBC: Sports Roundup. See S 0315.  
 0330 BBC: Anything Goes. See S 1430.  
 0333 BBC (af): Network Africa. Breakfast show of news, sport, personalities, music, and listener's comments.

## Tuesdays

- 0300 Radio Australia: Network Asia (Part 2). See S 2300.  
 0310 Radio Australia: Sports Report. See S 1310.  
 0315 BBC: Sports Roundup. See S 0315.

- 0330 BBC: John Peel. Tracks from newly released albums and singles from the contemporary music scene.  
 0333 BBC (af): Network Africa. See M 0333.

## Wednesdays

- 0300 Radio Australia: Network Asia (Part 2). See S 2300.

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- 0310 Radio Australia: Sports Report. See S 1310.  
 0315 BBC: Sports Roundup. See S 0315.  
 0333 BBC (af): Network Africa. See M 0333.

## Thursdays

- 0300 Radio Australia: Network Asia (Part 2). See S 2300.  
 0310 Radio Australia: Sports Report. See S 1310.  
 0315 BBC: Sports Roundup. See S 0315.  
 0330 BBC: Assignment. A weekly examination of a topical issue.  
 0333 BBC (af): Network Africa. See M 0333.

## Fridays

- 0300 Radio Australia: Network Asia (Part 2). See S 2300.  
 0310 Radio Australia: Sports Report. See S 1310.  
 0315 BBC: Sports Roundup. See S 0315.  
 0330 BBC: Focus on Faith. Comment and discussion on the major issues in the worlds of faith.  
 0333 BBC (af): Network Africa. See M 0333.

## Saturdays

- 0310 Radio Australia: Jazz Notes. See T 1330.  
 0315 BBC: Sports Roundup. See S 0315.  
 0330 BBC: The Vintage Chart Show. Each week a classic Top 20 from the past with Paul Burnett.  
 0330 Radio Australia: Music Deli. See F 1330.



## 0400 UTC

[11:00 PM EST/8:00 PM PST]

## FREQUENCIES

0400-0500	Australia, ABC Brisbane	4920do	9660do		
0400-0500	Australia, ABC Perth	9610do			
0400-0500	Australia, Radio 11720pa	11800pa	15240pa	15320pa	15365pa
	17715pa 17750as	17795pa	21525as	21595as	21740pa
0400-0500 vl	Australia, VL8A Alice Spg	4835do			
0400-0500 vl	Australia, VL8K Katherine	5025do			
0400-0500 vl	Australia, VL8T Tent Crk	4910do			
0400-0500	Bahrain, Radio	6010do			
0400-0404	Botswana, Radio	3356do	4830af	7255af	
0400-0500	Canada, CFCX Montreal	6005do			
0400-0500	Canada, CFRX Toronto	6070do			
0400-0500	Canada, CFVP Calgary	6030do			
0400-0500	Canada, CHNX Halifax	6130do			
0400-0500	Canada, CKZU Vancouver	6160do			
0400-0430	Canada, RCI Montreal	6105me	9505me	9670me	
0400-0500	China, China Radio Intl	11680na	11840na		
0400-0500 vl	Congo, R Natl Congolaise	4765do	5985do		
0400-0500	Costa Rica, R Peace Intl	7375am	7385am	21465am	
0400-0430	Croatian Radio via WHRI	7315na			
0400-0500	Cuba, Radio Havana Cuba	6010na	6180am		
0400-0430	Czech Republic, R Prague	5930na	7345na	9810na	11990na
	13715af 17535sa				
0400-0430	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0400-0450	Germany, Deutsche Welle	6015af	6145af	7150af	7225af
	9565af 9765af	11705af	11765af	13610af	13770af
0400-0430	Guatemala, Radio Cultural	3300do			
0400-0500	Kenya, Kenya BC Corp	4935do			
0400-0500 s	Lebanon, Wings of Hope	11530me			
0400-0500 smtwh	Malaysia, RTM Radio 4	7295do			
0400-0500 vl	Mexico, Radio Educacion	6185am			
0400-0500	New Zealand, R NZ Intl	15120pa			
0400-0450	North Korea, R Pyongyang	15180as	15230as	17765as	
0400-0500 vl	PNG, Natl BC	4890do			
0400-0430	Romania, R Romania Intl	6155na	9510na	9570na	11830na
	11940na				
0400-0500	Russia, Radio Moscow Intl	7205na	7305na	7335na	9610na
	9710am 9750eu	9860eu	9880na	9905na	11690na
	12030na 12050na	15425na	15535na	17560na	17570as
	17775as 17835as	17880as	21820as		
0400-0500	S Africa, Channel Africa	5960af	9695af		
0400-0500	Singapore, SBC Radio One	5010do	5052do	11940do	
0400-0430	Sri Lanka, SLBC Colombo	9720as	15425as		
0400-0430	Switzerland, Swiss R Intl	6135na	9860na	9885na	12035na
0400-0430 mtwhf	Switzerland, Swiss R Intl	3985eu	6165eu	9535eu	
0400-0430	Tanzania, Radio	5985af	9685af	11765af	
0400-0430	Thailand, Radio	4830as	9655as	11905as	
0400-0500	Turkey, Voice of	9445na			
0400-0500 vl	Uganda, Radio	4976do			
0400-0430	United Kingdom, BBC London	3955eu	5975ca	6180eu	6195eu
	7325na 9630af	9915am	11760me	11955me	12095eu
	15310as 15575me	21725as			
0400-0500	United Kingdom, BBC London	3255af	3955eu	5975na	6005af
	6190af 6195eu	9410af	9660af	11730af	11820af
	21470af				
0400-0500	USA, CSMonitor Boston MA	9840af			
0400-0500 sa	USA, CSMonitor Boston MA	17555as			
0400-0500	USA, KCBT Dallas TX	13720am			
0400-0500	USA, KTNB Salt Lk City UT	7510am			
0400-0500	USA, KVOH Los Angeles CA	9785am			
0400-0500	USA, VOA Washington DC	5995eu	6040eu	6140eu	7170eu
	7200eu 7265af	7280af	7405af	9575af	11965eu
	15205eu				
0400-0500	USA, WEWN Birmingham AL	7425na			
0400-0500	USA, WHRI Noblesville IN	7315na			
0400-0500	USA, WJCR Upton KY	7490na	13595na		
0400-0500 smtwhf	USA, WMLK Bethel PA	9465eu			
0400-0500	USA, WRNO New Orleans LA	7395am			
0400-0500	USA, WWCR Nashville TN	5810am	5935as	7435am	
0400-0500	USA, WYFR Keeschobee FL	6065na	9505na	11825eu	
0415-0440	Italy, RAI Rome	7275eu	9575eu		
0430-0450 s	Finland, Radio	6120eu	9665eu		
0430-0450	Finland, Radio	11755me	15440af		
0430-0500	Nigeria, Radio	3326do	4770do		
0430-0500	Russia, AWR Russia	15125eu			
0430-0500	Swaziland, Trans World R	3200af	7200af	7215af	
0430-0500	USA, VOA Washington DC	3980eu			
0435-0500 mtwhf	Namibia, Namibia BC Corp	4965af			
0445-0500 t	Sri Lanka, SLBC Colombo	9720na	15425na		
0455-0500	Nigeria, Voice of	7255af			

## SELECTED PROGRAMS

## Sundays

- 0410 Radio Australia: Feedback. NEW! Dennis Gibbons answers letters and discusses new programs and reception problems.
- 0415 BBC (af): African Perspective. Feature or discussion analyzing a major issue.
- 0415 BBC: Feature. "Coast to Coast" (14th, 21st, 28th). NEW! Mike McShane takes an imaginary, musical trip from New York to Los Angeles.
- 0415 BBC: Feature. "Live from the Archive" (7th). Steve Wright plays rare and unusual recordings from the BBC's archives.
- 0430 BBC: Feature. "Seeing Stars" (7th). Mercury makes a rare crossing of the Sun and other stellar news.
- 0430 BBC: Short Story. Variable dramas.
- 0430 Radio Australia: Correspondents' Report. See S 0030.
- 0445 BBC: Feature. "American Icons". NEW! Simon Boyce examines American logos and what they say about America.
- 0445 Radio Bulgaria: Lifestyle. See S 0115.

## Mondays

- 0410 Radio Australia: Variable Feature. These are repeat programs (or music) which are used as program fillers.
- 0415 BBC (af): Network Africa. See M 0333.
- 0415 BBC: Special Feature. "Images of Britain". How foreign journalists in the UK report about Britain.
- 0430 BBC (eu): Europe Today. News, features, profiles and trends for the new Europe.
- 0430 BBC: Off the Shelf. Daily readings from the best of world literature.
- 0430 Radio Australia: International Report. See M 0030.
- 0445 BBC: Andy Kershaw's World of Music. Recordings of diverse music from around the world.

## Tuesdays

- 0410 Radio Australia: Variable Feature. See M 0410.
- 0415 BBC (af): Network Africa. See M 0333.
- 0415 BBC: Health Matters. See T 0145.
- 0430 BBC (eu): Europe Today. See M 0430.
- 0430 BBC: Off the Shelf. See M 0430.
- 0430 Radio Australia: International Report. See M 0030.
- 0445 BBC: On Screen. Film reviews and movie news from around the world.

## Wednesdays

- 0410 Radio Australia: Variable Feature. See M 0410.
- 0415 BBC (af): Network Africa. See M 0333.
- 0425 BBC: Book Choice. Short book reviews every week.

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- 0430 BBC (eu): Europe Today. See M 0430.
- 0430 BBC: Off the Shelf. See M 0430.
- 0430 Radio Australia: International Report. See M 0030.
- 0445 BBC: Country Style. See W 0145.

## Thursdays

- 0410 Radio Australia: Variable Feature. See M 0410.
- 0415 BBC (af): Network Africa. See M 0333.
- 0415 BBC: The Farming World. See H 0145.
- 0430 BBC (eu): Europe Today. See M 0430.
- 0430 BBC: Off the Shelf. See M 0430.
- 0430 Radio Australia: International Report. See M 0030.
- 0445 BBC: From Our Own Correspondent. See S 0330.

## Fridays

- 0410 Radio Australia: Variable Feature. See M 0410.
- 0415 BBC (af): Network Africa. See M 0333.
- 0415 BBC: Classical Music Feature. See M 0145.
- 0430 BBC (eu): Europe Today. See M 0430.
- 0430 BBC: Off the Shelf. See M 0430.
- 0430 Radio Australia: International Report. See M 0030.
- 0445 BBC: Folk Routes. See T 0130.

## Saturdays

- 0410 Radio Australia: Book Reading. See S 0110.
- 0415 BBC (af): Talk About Africa. Telephone conversations with BBC correspondents on late-breaking African events.
- 0415 BBC: Good Books. See W 1445.
- 0430 BBC (eu): Europe Today. See M 0430.
- 0430 BBC: Jazz Now and Then. See A 0145.
- 0430 Radio Australia: Indian Pacific. See A 0030.



0500 UTC

**[12:00 AM EST/9:00 PM PST]**

## FREQUENCIES

0500-0600	Australia, ABC Brisbane	4920do	9660do						0500-0600 vl	S Africa, Radio Oranje	9630do						
0500-0600	Australia, ABC Perth	9610do							0500-0553 f	Seychelles, FEBA Radio	17750me						
0500-0530	Australia, Radio	17750as							0500-0600	Singapore, SBC Radio One	5052do	11940do					
0500-0600	Australia, Radio	11720pa	11800pa	15240pa	15320pa				0500-0515 vl	Somalia, Radio Free Somal	7460do						
	15365pa 17715pa	17795pa	21525as	21595as	21740pa				0500-0556	Spain, Spanish Natl Radio	9525na						
0500-0600 vl	Australia, VL8A Alice Spg	4835do							0500-0515 t	Sri Lanka, SLBC Colombo	9720na	15425na					
0500-0600 vl	Australia, VL8K Katherine	5025do							0500-0530	Swaziland, Trans World R	3200af	7200af	7215af				
0500-0600 vl	Australia, VL8T Tent Crk	4910do							0500-0515 mtwhf	Switzerland, Swiss R Intl	3985eu	6165eu	9535eu				
0500-0600	Bulgaria, Radio	9700na	11720na						0500-0600	Thailand, Radio	4830as	9655as	11905as				
0500-0600	Bahrain, Radio	6010do							0500-0600 vl	Uganda, Radio	4976do						
0500-0600	Canada, CFCX Montreal	6005do							0500-0600	United Kingdom,BBC London	3955eu	5975na	6180eu	6195eu			
0500-0600	Canada, CFRX Toronto	6070do								9410af 9600af	9640ca	11735eu	11760me	12095af			
0500-0600	Canada, CFPV Calgary	6030do								15070me 15310as	15400af	15420af	15575me	17830as			
0500-0600	Canada, CHNX Halifax	6130do								21470af							
0500-0600	Canada, CKZU Vancouver	6160do							0500-0600	USA, CSMonitor Boston MA	9840af						
0500-0600	Costa Rica, R Peace Intl	7375am	7385am	21465am					0500-0600 sa	USA, CSMonitor Boston MA	17555as						
0500-0515	Croatian Radio via WHRI	7315na	9495na						0500-0600	USA, KCBI Dallas TX	13720am						
0500-0600	Cuba, Radio Havana Cuba	6180na	9510na						0500-0600	USA, KTVN Salt Lk City UT	7510am						
0500-0530	Czech Republic, R Prague	7345na	9485na	9810me	11990as				0500-0600	USA, KVOH Los Angeles CA	9785am						
		13715as	17535as						0500-0600	USA, VOA Washington DC	3980eu	5995eu	6035af	6040eu			
0500-0600	Ecuador, HCJB Quito	11925am	21455am							6140eu 7170eu	7405eu	9665af	11965eu	12080af			
0500-0550	Germany, Deutsche Welle	5960na	9515na	9670na	11705na					15205eu 15600af							
0500-0515	Israel, Kol Israel	7465na	9435na	17545as					0500-0530	USA, WHRI Noblesville IN	7315na						
0500-0600	Japan, NHK/Radio Japan	6085me	7230eu	9725me	11725am				0500-0600	USA, WINB Red Lion PA	15145eu						
		11740am	15230na	15410am	17810am				0500-0600	USA, WJCR Upton KY	7490na	13595na					
0500-0600	Kenya, Kenya BC Corp	4935do							0500-0600 mtwhf a	USA, WMLK Bethel PA	9465eu						
0500-0600 mtwhf	Lebanon, Wings of Hope	11530me							0500-0600	USA, WRNO New Orleans LA	7395am						
0500-0505	Lesotho, Radio	4800do							0500-0600	USA, WWCR Nashville TN	5810am	5935am	7435am				
0500-0600	Malaysia, RTM Radio 4	7295do							0500-0600	USA, WYFR Okeechobee FL	5985na	9850eu	11850af				
0500-0600 vl	Mexico, Radio Educacion	6185am							0500-0520	Vatican State, Vatican R	6245eu	7250eu	11730af				
0500-0600 mtwhf	Namibia, Namibia BC Corp	3270af	3290af						0510-0520 mtwhf a	Botswana, Radio	3356af	4830af	7255af				
0500-0600	New Zealand, R NZ Intl	15120pa							0525-0600	Ghana, GBC Radio 2	3366do						
0500-0600	Nigeria, Radio	3326do	4770do	4990do					0530-0600	Austria, R Austria Intl	6015na	6155eu	13730eu	15410me			
0500-0600	Nigeria, Voice of	7255af									17870me						
0500-0600 vl	PNG, Natl BC	4890do							0530-0600	Georgia, Georgian Radio	11910eu						
0500-0600	Russia, Radio Moscow Intl	7205na	7335na	9610na	9750eu				0530-0600	Romania, R Romania Intl	15380af	17720af	17745af	17790af			
	9860eu 9880eu	9905eu	12030na	12050na	15535na				0530-0600 vl	Russia, Radio Centre	12010eu						
	17730as 17775af								0530-0600	Swaziland, Trans World R	3200af	7200af	11740af				
0500-0600	S Africa, Channel Africa	11745af							0530-0600	UAE, UAE Radio Dubai	15435as	17830as	21700as				

## SELECTED PROGRAMS

### Sundays

- 0505 Voice of Nigeria: VoN-Linkup. Call-in request music program.
- 0510 Radio Australia: Music of RA. Selections by Radio Australia announcers.
- 0515 Radio Bulgaria: Review of Current Affairs. Reports and analysis of current events in Bulgaria and the World.
- 0530 Radio Australia: At Your Request. See S 0330.
- 0530 Radio Bulgaria: From School to Campus. See S 0130.
- 0530 Voice of Nigeria: VoN-Scope. News, reports, review of Nigerian press, interviews and sports.

## Mondays

- 0500 Voice of Nigeria: Morning Flight. Music magazine which  
lightens up and informs listeners.
- 0515 Radio Bulgaria: Across the Map of Bulgaria. See M 0115.
- 0520 Radio Australia: Sports Report. See S 1310.
- 0530 BBC (eu): Europe Today. See M 0430.
- 0530 Radio Bulgaria: Weekly Spotlight. Focus on a particular  
subject affecting Bulgaria.
- 0530 Voice of Nigeria: VoN-Scope. See S 0530.
- 0545 Radio Bulgaria: Radio Bulgaria Calling. See S 2341.

## Tuesdays

- 0500 Voice of Nigeria: Morning Flight. See M 0500.  
0515 Radio Bulgaria: Review of Current Affairs. See S 0415.

- 0520 Radio Australia: Sports Report. See S 1310.  
0530 BBC (eu): Europe Today. See M 0430.  
0530 Radio Bulgaria: Business and Finance. See M 2315.  
0530 Voice of Nigeria: VoN-Scope. See S 0530.  
0545 Radio Bulgaria: Sports Roundup. See M 2330.  
0546 Radio Australia: Speaking Out. News about the indigenous people of Australia.

### Wednesdays

- 0500 Voice of Nigeria: Morning Flight. See M 0500.  
0515 Radio Bulgaria: Review of Current Affairs. See S 0415.  
0520 Radio Australia: Sports Report. See S 1310.  
0530 BBC (eu): Europe Today. See M 0430.  
0530 Radio Australia: Pacific Women. Conversations with Pacific women about their lives and the issues which affect them.  
0530 Radio Bulgaria: Answering Your Letters. See S 2315.  
0530 Voice of Nigeria: VoN-Scope. See S 0530.

### Thursdays

- 0500 Voice of Nigeria: Morning Flight. See M 0500.  
0515 Radio Bulgaria: Review of Current Affairs. See S 0415.  
0520 Radio Australia: Sports Report. See S 1310.  
0530 Radio Bulgaria: Listeners Club. A program for members of the Bulgarian Listeners Club.

- 0530 BBC (eu): Europe Today. See M 0430.  
0530 Voice of Nigeria: VoN-Scope. See S 0530.

## Fridays

- 0500 Voice of Nigeria: Morning Flight. See M 0500.  
0515 Radio Bulgaria: Review of Current Affairs. See S 0415.  
0520 Radio Australia: Sports Report. See S 1310.  
0530 BBC (eu): Europe Today. See M 0430.  
0530 Radio Bulgaria: Mosaical Facts about Bulgaria. See T 2341.  
0530 Voice of Nigeria: VoN-Scope. See S 0530.

### Saturdays

- 0500 Voice of Nigeria: African Safari. Thirty minutes of music from the countries of Africa.
- 0510 Radio Australia: Jazz Notes. See T 1330.
- 0515 Radio Bulgaria: Review of Current Affairs. See S 0415.
- 0530 BBC (eu): Europe Today. See M 0430.
- 0530 Radio Australia: Music Deli. See F 1330.
- 0530 Radio Bulgaria: Sports and Tourism. See S 2300.
- 0530 Voice of Nigeria: VoN-Scope. See S 0530.
- 0545 Radio Bulgaria: Music from Bulgaria. Selections of Bulgarian music.



## 0600 UTC

[1:00 AM EST/10:00 PM PST]

## FREQUENCIES

0600-0700	Australia, ABC Brisbane	9660do				0600-0630	Romania, R Romania Intl	7225eu	9510eu	9665eu	11810eu
0600-0700	Australia, ABC Perth	15425do				0600-0700	Russia, Radio Moscow Intl	7205na	9750eu	9905eu	12030af
0600-0700	Australia, Radio	6020pa	11720pa	11800pa	15240pa			12050af	15250na	15410na	17570am
		15320pa	15365pa	17670as	17715pa			17665na	17675am	21690am	
		17880as	21525as	21595as	21740pa						
0600-0700 vl	Australia, VL8A Alice Spg	4835do				0600-0700	S Africa, Channel Africa	17710af			
0600-0700 vl	Australia, VL8K Katherine	5025do				0600-0700 vl	S Africa, Radio Orange	9630do			
0600-0700 vl	Australia, VL8T Tent Crk	4910do				0600-0700 vl	Sierra Leone, SLBS	3316do			
0600-0700	Bahrain, Radio	6010do				0600-0700	Singapore, SBC Radio One	5010do	5052do	11940do	
0600-0630	Bulgaria, Radio	9700na	11720na			0600-0630 vl	Solomon Islands, SIBC	5020do	9545do		
0600-0700	Canada, CFCX Montreal	6005do				0600-0700	South Korea, Radio Korea	7275na	11945na	15155na	
0600-0700	Canada, CFRX Toronto	6070do				0600-0700	Swaziland, Trans World R	3200af	11740af		
0600-0700	Canada, CFVP Calgary	6030do				0600-0615	Switzerland, Swiss R Intl	3985eu	6165eu	9535eu	
0600-0700	Canada, CHNX Halifax	6130do				0600-0630	Switzerland, Swiss R Intl	13635af	15430af	17565af	
0600-0700	Canada, CKZU Vancouver	6160do				0600-0700 as	Thailand, Radio	4830as	9655as	11905as	
0600-0630 mtwtf	Canada, RCI Montreal	6050eu	6150eu	7155af	9740af	0600-0700	United Kingdom, BBC London	3955eu	5975ca	6190af	7150pa
		9760af	11905af					9410eu	9640na	11780eu	11820af
0600-0700	Costa Rica, R Peace Intl	7375am	7385am	21465am				11940af	12095eu	15360as	15420af
0600-0700	Cuba, Radio Havana Cuba	9510na						15575eu	17790as	17830as	17885af
0600-0630	Czech Republic, R Prague	6055eu	7345eu	9505eu	11990eu			21470me			
0600-0700	Ecuador, HCJB Quito	11925am	15155am	21455am		0600-0700	USA, CSMonitor Boston MA	5850eu	9840eu		
0600-0650	Germany, Deutsche Welle	11780af	13790af	15185af	15205af	0600-0700	USA, KCBI Dallas TX	13720am			
		17875af				0600-0700	USA, KTNB Salt Lk City UT	7510na			
0600-0615	Ghana, GBC Radio 1	4915do				0600-0700	USA, KVOH Los Angeles CA	9785na			
0600-0615	Ghana, GBC Radio 2	3366do				0600-0700	USA, VOA Washington DC	3980eu	5995eu	6005af	6035af
0600-0700 vl	Italy, IRRS Milano	7125eu						6040eu	6060eu	6140eu	7170eu
0600-0700	Japan, NHK/Radio Japan	11860as	15325as	21610as				7325eu	7405af	9530af	9665af
0600-0625	Kenya, Kenya BC Corp	4935do						11805af	11925af	11965eu	12080af
0600-0700 vl	Kiribati, Radio	9825do				0600-0700	USA, WEWN Birmingham AL	7425na			
0600-0630	Laos, National Radio of	7116as				0600-0700	USA, WHRI Noblesville IN	7315eu	9495am		
0600-0630 s	Latvia, R Latvia Intl	5935eu				0600-0700	USA, WJCR Upton KY	7490na	13595na		
0600-0630 mtwhf	Lebanon, Wings of Hope	11530me				0600-0700 smtwhf	USA, WMLK Bethel PA	9465eu			
0600-0700 as	Lebanon, Wings of Hope	11530me				0600-0700	USA, WWCR Nashville TN	5935am	7435am		
0600-0700	Liberia, Radio ELWA	4760do				0600-0700	USA, WYFR Okeechobee FL	5985na	7355eu	9680eu	11580af
0600-0700 smtwha	Malaysia, RTM Radio 4	7295do				0600-0610 mtwhfa	Vatican State, Vatican R	6245eu	7250eu	9645eu	11740eu
0600-0700	Malaysia, Voice of	6175as	9750as	15295as				15210eu			
0600-0700	Malta, V of Mediterranean	9765me				0600-0620	Vatican State, Vatican R	6245eu	7250me		
0600-0700	Namibia, Namibia BC Corp	6175af				0603-0610	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
0600-0700	New Zealand, R NZ Intl	15120pa				0625-0700	Kenya, Kenya BC Corp	4935do			
0600-0700 s	New Zealand, ZLXA	3935do				0630-0700	Austria, R Austria Intl	6015na			
0600-0700	Nigeria, Radio	3970do	4770do			0630-0700	Italy, AWR Europe	7210eu			
0600-0700	Nigeria, Voice of	7255af				0630-0700 smtwhf	New Zealand, ZLXA	3935do			
0600-0650	North Korea, R Pyongyang	15180as	15230as			0630-0700	Vatican State, Vatican R	9625af	11625af	15090af	
0600-0700 vl	PNG, Natl BC	4890do				0632-0641	Romania, R Romania Intl	7225eu	9510eu	9665eu	11810eu
						0645-0700	Finland, Radio	6120eu	9560eu	11755eu	
						0645-0715	Romania, R Romania Intl	11775pa	15250pa	15335pa	17720pa

## SELECTED PROGRAMS

## Sundays

- 0600 Voice of Nigeria: Preview of Programs for the Week. What's happening on Radio Nigeria in the next seven days.
- 0605 BBC (af): Postmark Africa. See S 0335.
- 0610 Radio Australia: Feedback. See S 0410.
- 0615 BBC: Letter from America. Alistair Cooke shares his intimate view of contemporary American life.
- 0615 Voice of Nigeria: Listeners' Letters. Typical mailbag program with info for pen pals.
- 0630 BBC (af): African Perspective. See S 0415.
- 0630 BBC: Jazz for the Asking. Record requests with Malcolm Laylock.
- 0630 Radio Australia: Correspondents' Report. See S 0030.
- 0640 Voice of Nigeria: Commentary. Opinion on events in Nigeria.

## Mondays

- 0602 BBC (af): Network Africa. See M 0333.
- 0615 BBC: The Learning World. News and views about worldwide education.
- 0630 BBC (af): Network Africa. See M 0333.
- 0630 BBC: Feature. "Making America". See S 1401.
- 0630 Radio Australia: International Report. See M 0030.
- 0640 Voice of Nigeria: Commentary. See S 0640.

## Tuesdays

- 0602 BBC (af): Network Africa. See M 0333.
- 0615 BBC: The World Today. See M 1645.
- 0630 BBC (af): Network Africa. See M 0333.
- 0630 BBC: Feature. "Broadway Lights" (from 9th). New! The history of the Broadway musical.
- 0630 BBC: Feature. "The Tunesmiths" (2nd). Lives and music of great 20th century songwriters.
- 0630 Radio Australia: International Report. See M 0030.
- 0640 Voice of Nigeria: Commentary. See S 0640.

## Wednesdays

- 0602 BBC (af): Network Africa. See M 0333.
- 0615 BBC: The World Today. See M 1645.
- 0615 Voice of Nigeria: Wheel of Progress. Industrial and agricultural development in Nigeria.
- 0630 BBC (af): Network Africa. See M 0333.
- 0630 BBC: Meridian Documentary. One of three topical programmes weekly about the world of the arts.
- 0630 Radio Australia: International Report. See M 0030.

## Thursdays

- 0602 BBC (af): Network Africa. See M 0333.
- 0615 BBC: The World Today. See M 1645.

- 0615 Voice of Nigeria: Midweek Sports. News, views and reports of sports in Nigeria and the whole world.
- 0630 BBC (af): Network Africa. See M 0333.
- 0630 BBC: Sports International. See H 0230.
- 0630 Radio Australia: International Report. See M 0030.

## Fridays

- 0600 Voice of Nigeria: Listeners' Letters. See S 0615.
- 0602 BBC (af): Network Africa. See M 0333.
- 0615 BBC: The World Today. See M 1645.
- 0615 Voice of Nigeria: Images of Nigeria. See S 1645.
- 0630 BBC (af): Network Africa. See M 0333.
- 0630 BBC: Meridian Books. See W 0630.
- 0630 Radio Australia: International Report. See M 0030.

## Saturdays

- 0600 Voice of Nigeria: Music for Royalty. Hear drums and unusual instruments in music for African royalty.
- 0615 BBC: The World Today. See M 1645.
- 0630 BBC (af): Spice Taxi. A sideways look at African culture, from presidential style to cult films.
- 0630 BBC: Meridian Reports. See W 0630.
- 0640 Voice of Nigeria: Commentary. See S 0640.



## 0700 UTC

[2:00 AM EST/11:00 PM PST]

0700-0800	Australia, ABC Brisbane	4920do	9660do		
0700-0800	Australia, ABC Perth	15425pa			
0700-0730	Australia, Radio	15320pa	17715pa	21740pa	
0700-0800	Australia, Radio	6020eu	11720pa	11880pa	15240pa
		15365pa	17695as	17790as	21525as
		21595as			
0700-0800 vl	Australia, VL8A Alice Spg	4835do			
0700-0800 vl	Australia, VL8K Katherine	5025do			
0700-0800 vl	Australia, VL8T Tent Crk	4910do			
0700-0800	Bahrain, Radio	6010do			
0700-0755	Belgium, R Vlaanderen Int	5910eu	9925au		
0700-0800	Canada, CFCX Montreal	6005do			
0700-0800	Canada, CFRX Toronto	6070do			
0700-0800	Canada, CFVP Calgary	6030do			
0700-0800	Canada, CHNX Halifax	6130do			
0700-0800	Canada, CKZU Vancouver	6160do			
0700-0800	Costa Rica, R Peace Intl	7375am	7385am	21465am	
0700-0730	Czech Republic, R Prague	6055eu	7345eu	9505eu	11990eu
0700-0730	Ecuador, HCJB Quito	9600eu	9745na	11835eu	11925am
		15270am	17490am	21455eu	
		4915do			
0700-0715	Ghana, GBC Radio 1	3366do			
0700-0715	Ghana, GBC Radio 2	7125am			
0700-0800 vl	Italy, IRRS Milano	6050as	7230au	11740au	15170as
0700-0800	Japan, NHK/Radio Japan	15325au	15410au	17765as	17810as
		17860as	21575me	21610me	
0700-0800	Kenya, Kenya BC Corp	4935do			
0700-0800 vl	Kiribati, Radio	9825do			
0700-0800 smtwha	Malaysia, RTM Radio 4	7295do			
0700-0800	Malaysia, Voice of	6175as	9750as	15295as	
0700-0730	Myanmar, Radio	9730do			
0700-0800	New Zealand, R NZ Intl	9700pa			
0700-0800 smtwhf	New Zealand, ZLXA	3935do			
0700-0800	Nigeria, Radio	3326do	4990do		
0700-0750	North Korea, R Pyongyang	15340as	17765as		
0700-0800 vl	PNG, Natl BC	4890do			
0700-0800 vl	PNG, Radio Central	3290do			
0700-0800 vl	PNG, Radio Enga	2410do			
0700-0800 vl	PNG, Radio Milne Bay	3365do			
0700-0800 vl	PNG, Radio Western	3305do			
0700-0715	Romania, R Romania Intl	11810pa	11940pa	15335pa	17720pa
		17805pa	21665pa		
0700-0800	Russia, AWR Russia	11835eu			
0700-0800	Russia, Radio Moscow Intl	9610eu	9710eu	11710me	13705am
		15140af	15225am	17560af	17570af
		17660am	17735am	21690af	
0700-0800 vl	S Africa, Radio Oranje	9630do			
0700-0800 vl	Sierra Leone, SLBS	3316do			
0700-0800	Singapore, SBC Radio One	5010do	5052do	11940do	
0700-0800	Solomon Islands, SIBC	5020do	9545do		
0700-0800	Swaziland, Trans World R	7200af	11740af		
0700-0800	Taiwan, VO Free China	5950na			
0700-0800 as	Thailand, Radio	4830as	9655as	11905as	
0700-0800	United Kingdom, BBC London	3955eu	5975ca	6190af	6195eu
		7325eu	9410eu	9640na	9660eu
		9760eu	11760me	11780ca	11940af
		12095eu	15070eu	15310as	15400af
		15575me	17790af	17885af	21470af
		21660af			
0700-0800	USA, CSMonitor Boston MA	9840eu			
0700-0800	USA, KCBI Dallas TX	13720am			
0700-0800	USA, KTNB Salt Lk City UT	7510na			
0700-0800	USA, KVOH Los Angeles CA	9785na			
0700-0800	USA, WEWN Birmingham AL	9350am	11580am		
0700-0800	USA, WHRI Noblesville IN	7315eu	9495am		
0700-0800	USA, WJCR Upton KY	7490na	13595na		
0700-0800 smtwhf	USA, WMLK Bethel PA	9465eu			
0700-0800	USA, WWCR Nashville TN	5935am	7435am		
0700-0800	USA, WYFR Okeechobee FL	7355eu	9680eu	11580af	
0703-0715	Croatia, Croatian Radio	6145eu	9830eu	13640eu	
0730-0800	Australia, Radio	17750as			
0730-0757	Czech Republic, R Prague	6055eu	11990pa	13600as	17535pa
		17725as	21705pa		
0730-0800	Ecuador, HCJB Quito	9745pa	11835eu	11925pa	15270eu
		17490eu	21455eu		
0730-0800	Georgia, Georgian Radio	11910me			
0730-0745 mtwhf	Iceland, Natl BC Service	9265om			
0730-0800	Netherlands, Radio	9630pa	9720pa		
0740-0800	Monaco, Trans World Radio	7385eu			

## 0800 UTC

[3:00 AM EST/12:00 AM PST]

0800-0900	Australia, ABC Brisbane	9660do			
0800-0900	Australia, ABC Perth	15425do			
0800-0900	Australia, Radio	6080pa	7240pa	9710as	15240pa
		17695as	17750as	21525as	21595as
0800-0830 vl	Australia, VL8A Alice Spg	4835do			
0800-0830 vl	Australia, VL8K Katherine	5025do			
0800-0830 vl	Australia, VL8T Tent Crk	4910do			
0800-0900	Bahrain, Radio	6010do			
0800-0900	Canada, CFCX Montreal	6005do			
0800-0900	Canada, CFRX Toronto	6070do			
0800-0900	Canada, CFVP Calgary	6030do			
0800-0900	Canada, CHNX Halifax	6130do			
0800-0900	Canada, CKZU Vancouver	6160do			
0800-0900	Costa Rica, R Peace Intl	7385am	7385am	21465am	
0800-0830	Ecuador, HCJB Quito	9600eu	9745pa	11835eu	11925pa
		17490au	21455eu		
		17800as	21550as		
0800-0900	Finland, Radio				
0800-0805 s	Ghana, GBC Radio 1	4915do			
0800-0805 s	Ghana, GBC Radio 2	3366do			
0800-0900 asmtwh	Guam, KTWB Agana	15200as			
0800-0900	Indonesia, Voice of	9675as	11752au		
0800-0900 vl	Italy, IRRS Milano	7125eu			
0800-0900	Kenya, Kenya BC Corp	4935do			
0800-0900 smtwha	Malaysia, RTM Radio 4	7295do			
0800-0825	Malaysia, Voice of	6175as	9750as	15295as	
0800-0900	Monaco, Trans World Radio	7385eu			
0800-0900	New Zealand, R NZ Intl	9700pa			
0800-0900 smtwhf	New Zealand, ZLXA	3935do			
0800-0900	Nigeria, Radio	3326do	4990do		
0800-0850	North Korea, R Pyongyang	15180as	15230as		
0800-0830 s	Norway, Radio Norway Intl	15175as	17740pa		
0800-0900 vl	PNG, Natl BC	4890do			
0800-0900 vl	PNG, Radio Central	3290do			
0800-0900 vl	PNG, Radio Enga	2410do			
0800-0900 vl	PNG, Radio Milne Bay	3365do			
0800-0900 vl	PNG, Radio Western	3305do			
0800-0900	Russia, Radio Moscow Intl	7315eu	17560af	17645af	17660af
		17735am	17760am	17890am	21450am
		21465am	21690am		
0800-0900 vl	S Africa, Radio Oranje	9630do			
0800-0830 vl	Sierra Leone, SLBS	3316do			
0800-0900	Singapore, SBC Radio One	5010do	5052do	11940do	
0800-0900 vl	Solomon Islands, SIBC	5020do	9545do		
0800-0900	South Korea, Radio Korea	7550af	13670eu	15155eu	
0800-0835	Swaziland, Trans World R	7200af	11740af		
0800-0900	United Kingdom, BBC London	3955eu	6190af	7325eu	9410eu
		9640na	9660eu	9760eu	11760me
		11940af	15400af	15575me	17790as
		17885af	21470af	21660af	
0800-0900	USA, CSMonitor Boston MA	13615pa			
0800-0900	USA, KCBI Dallas TX	9815am			
0800-0900	USA, KNLS Anchor Point AK	7345as			
0800-0900	USA, KTNB Salt Lk City UT	7510am			
0800-0900	USA, WEWN Birmingham AL	9350am			
0800-0900	USA, WHRI Noblesville IN	7315am	9495am		
0800-0900	USA, WJCR Upton KY	7490na	13595na		
0800-0900 smtwhf	USA, WMLK Bethel PA	9465eu			
0800-0900	USA, WWCR Nashville TN	5935am			
0803-0805	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
0830-0900 vl	Australia, VL8A Alice Spg	2310do			
0830-0900 vl	Australia, VL8K Katherine	2485do			
0830-0900 vl	Australia, VL8T Tent Crk	2325do			
0830-0900	Austria, R Austria Intl	6155eu	13730eu	15450as	
0830-0857	Czech Republic, R Prague	6055eu	11990eu	17535as	17725as
		21705pa			
0830-0900	Ecuador, HCJB Quito	9745pa	11925pa	21455pa	
0830-0900	Georgia, Georgian Radio	11910eu			
0830-0900	Netherlands, Radio	9720pa			
0830-0857	Slovakia, R Slovakia Intl	11990au	15605au	17535au	21705au
0830-0845	Vatican State, Vatican R	6245eu	7250eu	9645eu	15210eu
0835-0850 mtwhf	Swaziland, Trans World R	11740af			
0845-0900 s	Armenia, Radio Yerevan	15170na	15510na	17770na	



0900 UTC [4:00 AM EST/1:00 AM PST]

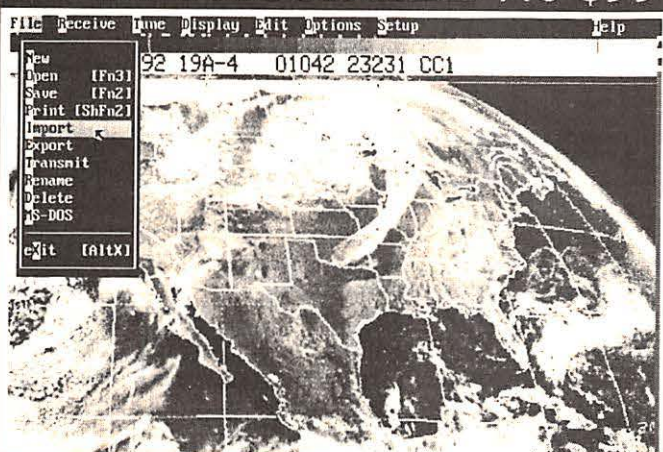
1000 UTC [5:00 AM EST/2:00 AM PST]

0900-0950	Australia, AAF Radio	20418as	25322af		
0900-1000	Australia, ABC Brisbane	4920do	9660do		
0900-1000	Australia, Radio	5995pa	9510as	9580pa	13605as
		15170as	21745as		
0900-1000 vl	Australia, VL8A Alice Spg	2310do			
0900-1000 vl	Australia, VL8K Katherine	2485do			
0900-1000 vl	Australia, VL8T Tent Crk	2325do			
0900-1000	Bahrain, Radio	6010do			
0900-1000	Bhutan, BC Service	6035do			
0900-1000	Canada, CFCX Montreal	6005do			
0900-1000	Canada, CFRX Toronto	6070do			
0900-1000	Canada, CFVP Calgary	6030do			
0900-1000	Canada, CHNX Halifax	6130do			
0900-1000	Canada, CKZU Vancouver	6160do			
0900-1000	China, China Radio Intl	11755pa	15440pa	17710pa	
0900-1000	Costa Rica, R Peace Intl	7375am	7385am	21465am	
0900-1000	Ecuador, HCJB Quito	9745pa	11925pa	17490pa	21455pa
0900-0950	Germany, Deutsche Welle	6160as	9565af	11715as	17780as
		17820as	21600af	21650as	21680as
0900-0915 mtwtf	Ghana, GBC Radio 1	4915do			
0900-0915	Ghana, GBC Radio 2	3366do			
0900-1000	Guam, KTWB Agana	11805pa			
0900-0915 vl	Italy, IRRS Milano	7125eu			
0900-1000	Japan, NHK/Radio Japan	9750pa	11740pa	11815pa	11910pa
		15190pa	17860au		
0900-1000	Kenya, Kenya BC Corp	4935do			
0900-1000 mtwhf	Lebanon, King of Hope	6280me			
0900-1000	Malaysia, RTM Radio 4	7295do			
0900-0920	Monaco, Trans World Radio	7385eu			
0900-0935 a	Monaco, Trans World Radio	7385eu			
0900-0945 s	Monaco, Trans World Radio	7385eu			
0900-1000	New Zealand, R NZ Intl	9700pa			
0900-0930 mtwhf	New Zealand, ZLXA	3935do			
0900-1000	Nigeria, Radio	3326do	4990do		
0900-1000 mtwtf	Palau, KHBV Voice of Hope	9830as			
0900-1000	Philippines, FEBC Manila	11690as			
0900-1000 vl	PNG, Natl BC	4890do			
0900-1000 vl	PNG, Radio Central	3290do			
0900-1000 vl	PNG, Radio Enga	2410do			
0900-1000 vl	PNG, Radio Milne Bay	3365do			
0900-1000 vl	PNG, Radio Western	3305do			
0900-1000	Russia, Radio Moscow Intl	7205af	9750af	11805as	11970af
		12010as	12015as	15490af	17560af
		17645af	17660af	17735am	17760am
		17890af	21690am		
0900-1000 vl	S Africa, Radio Oranje	9630do			
0900-1000	Singapore, SBC Radio One	5010do	5052do	11940do	
0900-1000 vl	Solomon Islands, SIBC	5020do	9545do		
0900-0930	Switzerland, Swiss R Intl	9885au	13685au	17670au	21820au
0900-1000	United Kingdom, BBC London	6190af	6195eu	9410eu	9660eu
		9750eu	9760eu	11760me	11940af
		12095eu	15070eu	15190sa	15310as
		15400af	15575me	17640eu	17705eu
		17790af	17885af	21470af	21660af
0900-1000	USA, CSMonitor Boston MA	9455sa	9840au	13615au	17555eu
0900-1000	USA, KCBI Dallas TX	9815am			
0900-1000	USA, KTVN Salt Lk City UT	7510am			
0900-1000	USA, WEWN Birmingham AL	9370eu			
0900-1000	USA, WHRI Noblesville IN	7315am	7355am		
0900-1000	USA, WJCR Upton KY	7490na	13595na		
0900-1000 smtwhf	USA, WMLK Bethel PA	9465eu			
0900-1000	USA, WWCR Nashville TN	5935am			
0910-0940 smha	Mongolia, R Ulaanbaatar	11850as	12015as		
0915-1000	Ghana, GBC Radio 2	6130do	7295do		
0915-0930 smtwh	Guam, KTWB Agana	15200as			
0930-1000	Italy, AWR Europe	7230eu			
0930-1000	Netherlands, Radio	7260as	9720pa	9810as	9865pa
0930-0957	Slovakia, R Slovakia Intl	11990au	15605au	17535au	21705au
0940-0950	Greece, Voice of	15650au	17525au		

1000-1100	Australia, ABC Brisbane	4920do			
1000-1100	Australia, Radio	5995pa	9580pa	15170as	21745as
1000-1100 vl	Australia, VL8A Alice Spg	2310do			
1000-1100 vl	Australia, VL8K Katherine	2485do			
1000-1100 vl	Australia, VL8T Tent Crk	2325do			
1000-1100	Bahrain, Radio	6010do			
1000-1025 mtwtf	Belgium, R Vlaanderen Int	9905eu	17515eu	21815af	
1000-1100	Canada, CFCX Montreal	6005do			
1000-1100	Canada, CFRX Toronto	6070do			
1000-1100	Canada, CFVP Calgary	6030do			
1000-1100	Canada, CHNX Halifax	6130do			
1000-1100	Canada, CKZU Vancouver	6160do			
1000-1100	China, China Radio Intl	11755pa	15440pa	17710pa	
1000-1100	Costa Rica, AWR Alajuela	9725ca			
1000-1100	Costa Rica, R Peace Intl	7375am	7385am	21465am	
1000-1100	Ecuador, HCJB Quito	9745pa	11925pa	17490pa	21455pa
1000-1100	Ghana, GBC Radio 2	6130do	7295do		
1000-1100	India, All India Radio	15050as	17387au	17895as	21735au
1000-1100 vl	Italy, IRRS Milano	7125va			
1000-1100	Kenya, Kenya BC Corp	4935do			
1000-1100 mtwhf	Lebanon, King of Hope	6280me			
1000-1100 vl	Malaysia, RTM Kota Kinab	5980do			
1000-1100 mtwh	Malaysia, RTM Radio 4	7295do			
1000-1100 vl	Malaysia, RTM Sarawak	4950do	7160do		
1000-1100	New Zealand, R NZ Intl	9700pa			
1000-1100	Nigeria, Radio	4990do	7285do		
1000-1100	Nigeria, Voice of	7255af			
1000-1030 s	Norway, Radio Norway Intl	17840eu	21705eu		
1000-1100 mtwhf	Palau, KHBV Voice of Hope	9830as			
1000-1100	Philippines, FEBC Manila	9800as	11685as		
1000-1100 vl	PNG, Natl BC	4890do			
1000-1100 vl	PNG, Radio Central	3290do			
1000-1100 vl	PNG, Radio Enga	2410do			
1000-1100 vl	PNG, Radio Milne Bay	3365do			
1000-1100 vl	PNG, Radio Western	3305do			
1000-1100	Russia, Radio Moscow Intl	11800eu	15140eu	15225na	15350me
		15355eu	15470eu	15490as	15520as
		17705as	17760as	17790na	21465as
1000-1100	S Africa, Channel Africa	17805af			
1000-1100 vl	S Africa, Radio Oranje	9630do			
1000-1100	Singapore, SBC Radio One	5010do	5052do	11940do	
1000-1045	Switzerland, Swiss R Intl	6165eu	9535eu		
1000-1100	United Kingdom, BBC London	6190af	9410eu	9660eu	9750eu
		9760eu	11760me	11940af	12095eu
		15070eu	15190sa	15310as	15400af
		15575me	17640eu	17705eu	17790af
		17885af	21470af	21660af	
1000-1100	USA, CSMonitor Boston MA	13625as	17555as		
1000-1100	USA, KCBI Dallas TX	9815am			
1000-1100	USA, KTVN Salt Lk City UT	7510am			
1000-1100	USA, VOA Washington DC	5985pa	7405ca	9590ca	11720pa
		11915ca	15120ca	15425as	
1000-1100	USA, WHRI Noblesville IN	7315am			
1000-1100	USA, WJCR Upton KY	7490na	13595na		
1000-1100	USA, WWCR Nashville TN	5935am	15685am		
1000-1100	USA, WYFR Okeechobee FL	5950na			
1000-1015 mtwhf	Vatican State, Vatican R	6245eu	7250eu	11740eu	15210eu
		21665eu			
1000-1030	Vietnam, Voice of	9840as	12020as	15010as	
1003-1006	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
1030-1100 mtwtf	Austria, R Austria Intl	6155eu	13730eu	15450au	17870as
1030-1057	Czech Republic, R Prague	6055eu	7345eu	9505eu	11990eu
		15355eu			
1030-1100	Netherlands, Radio	7260as	9810as		
1030-1100	South Korea, Radio Korea	11715na			
1030-1100	Sri Lanka, SLBC Colombo	11835as	15120as	17850as	
1030-1100	UAE, UAE Radio Dubai	13675eu	15320eu	15435eu	21605eu
1040-1050	Greece, Voice of	15650as	17525as		



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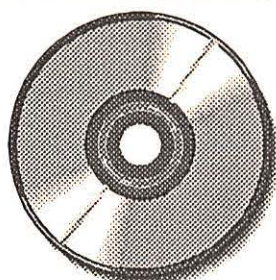
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1100 UTC

**[6:00 AM EST/3:00 AM PST]**

## FREQUENCIES

1100-1200	Australia, ABC Brisbane	4920do				1100-1200	S Africa, Channel Africa	9740af			
1100-1200	Australia, Radio	5995pa	6020pa	6080as	7240pa	1100-1200 vl	S Africa, Radio Oranje	9630do			
		9510as	9580pa	9710as	13605as	1100-1200	Singapore, SBC Radio One	5010do	5052do	11940do	
		15170as	17910as			1100-1200	South Korea, Radio Korea	6145na	9650na	9980na	
1100-1200 vl	Australia, VL8A Alice Spg	2310do				1100-1130	Sri Lanka, SLBC Colombo	11835as	15120as	17850as	
1100-1200 vl	Australia, VL8K Katherine	2485do				1100-1130	Switzerland, Swiss R Intl	13635as	15505as	17670as	17670as
1100-1200 vl	Australia, VL8T Tent Crk	2325do						21820as			
1100-1200	Bahrain, Radio	6010do				1100-1200	Taiwan, Voice of Asia	7445as			
1100-1200	Canada, CFCX Montreal	6005do				1100-1200	United Kingdom,BBC London	5975na	6190af	6195na	9410eu
1100-1200	Canada, CFRX Toronto	6070do						9515na	9660eu	9750eu	9760eu
1100-1200	Canada, CFVP Calgary	6030do						11760me	11940af	12095eu	15070eu
1100-1200	Canada, CHNX Halifax	6130do						15220na	15310as	15400af	17640eu
1100-1200	Canada, CKZU Vancouver	6160do						17705eu	17790sa	17885me	21470af
1100-1200	Costa Rica, AWR Alajuela	9722ca	11870ca					21660af			
1100-1200	Costa Rica, R Peace Intl	7375am	7385am	21465am		1100-1200	USA, CSMonitor Boston MA	9455na	9465na	9431	
1100-1130	Ecuador, HCJB Quito	9745pa	11925pa	21455pa		1100-1200	USA, KCBI Dallas TX	9815am			
1100-1150	Germany, Deutsche Welle	15370af	15410af	17715af	17765af	1100-1200	USA, KTVB Salt Lk City UT	7510na			
		17800af	17860af	21465af	21600af	1100-1200	USA, VOA Washington DC	5985pa	6110as	7405ca	9590ca
								9760as	11720pa	11915ca	15120ca
1100-1115	Ghana, GBC Radio 1	4915do						15160as	15425as		
1100-1130	Israel, Kol Israel	15640na	15650as	17575na		1100-1200	USA, WHRI Noblesville IN	7315na	9850sa	11790sa	
1100-1200 vl	Italy, IRRS Milano	7125eu				1100-1200	USA, WJCR Upton KY	7490na	13595na		
1100-1200	Japan, NHK/Radio Japan	6120na	11910na	15240na		1100-1200	USA, WWCN Nashville TN	5935am	15685am		
1100-1200	Jordan, Radio	13655eu				1100-1200	USA, WYFR Okeechobee FL	5950na	7355na		
1100-1200 vl	Malaysia, RTM Kota Kinaba	5980do				1100-1115 mtwffa	Vatican State, Vatican R	6245eu	7250eu	11740eu	15210eu
1100-1200	Malaysia, RTM Radio 4	4950do	7295do					21655eu			
1100-1200 vl	Malaysia, RTM Sarawak	4950do	7160do			1100-1130	Vietnam, Voice of	7287as	9730as		
1100-1200	New Zealand, R NZ Intl	9700pa				1130-1200	Bulgaria, Radio	11645eu	13645eu		
1100-1150	North Korea, R Pyongyang	6576na	9977na	11335na		1130-1157	Czech Republic, R Prague	6055eu	7345eu	9505eu	11990eu
1100-1200 mtwhf	Palau, KHBN Voice of Hope	9830as						15355eu			
1100-1200 vl	PNG, Natl BC	4890do				1130-1200	Ecuador, HCJB Quito	11925am	15115am	17890am	21455am
1100-1200 vl	PNG, Radio Central	3290do				1130-1150 mtwhf	Finland, Radio	11735na	15400na		
1100-1200 vl	PNG, Radio Enga	2410do				1130-1200	Iran, VOIRI Tehran	9525me	11715me	11790me	11910as
1100-1200 vl	PNG, Radio Milne Bay	3365do						11930as			
1100-1200 vl	PNG, Radio Western	3305do				1130-1200	Netherlands, Radio	5955eu	9850eu		
1100-1200	Russia, Radio Moscow Intl	15125as	15140me	15155as	15280as	1130-1200	Serbia, Radio Yugoslavia	21605au			
		15290as	15440na	15465as	15500as	1130-1200	Thailand, Radio	4830as	9655as	11905as	
		15520me	15540as	15590as	17590na						
		17660me	17670me	17675na	17705as						
		17755me	17760na	17780me	21465as						

## SELECTED PROGRAMS

### Sundays

- 1110 VOA (as): New Horizons. The world of science, medicine,  
and technology.
- 1130 BBC: Play of the Week. See S 0030.
- 1130 BBC: The John Dunn Show. See S 0030.
- 1130 Radio Australia: Fine Music Australia. The best Australian  
fine music performances and compositions.
- 1130 VOA (as): Issues in the News. Members of the Washington  
press corps discuss current topics.
- 1145 Radio Bulgaria: Review of Current Affairs. See S 0415.

### **Mondays**

- 1110 VOA (as): Development Report (Special English). See M 0040.  
1115 VOA (as): This is America (Special English). See S 1645.  
1120 Radio Australia: Variable Feature. See M 0410.  
1130 BBC: Composer of the Month. See M 0230.  
1130 Radio Australia: Innovations. Desley Blanch reports on Australian inventions and innovative practices.  
1130 VOA (as): Music U.S.A. (Standards). Classics of American popular music.  
1145 Radio Bulgaria: Review of Current Affairs. See S 0415.

## Tuesdays

- 1110 VOA (as): Agriculture Report (Special English). Developments in agriculture.
- 1115 VOA (as): Science in the News (Special English). The latest developments in science.

- 1120 Radio Australia: Variable Feature. See M 0410.  
1130 BBC: Megamix. Compendium of music, sport, fashion,  
health, travel, news and views for young people.  
1130 Radio Australia: Communicator. The latest developments in  
the media and communications world.  
1130 VOA (as): Now Music U. S. A.. Rock and soul music from old  
favorites to the latest hits with performer profiles.  
1145 Radio Bulgaria: Review of Current Affairs. See S 0415.

### Wednesdays

- 1110 VOA (as): Science Report (Special English). See W 0040.  
1115 VOA (as): Space and Man (Special English). See W 0045.  
1120 Radio Australia: Variable Feature. See M 0410.  
1130 BBC: Meridian Documentary. See W 0630.  
1130 Radio Australia: Science File. Ian Wood examines science,  
medicine and technology news for the Asian/Pacific region.  
1130 VOA (as): Now Music U.S.A.. See T 1130.  
1145 Radio Bulgaria: Review of Current Affairs. See S 0415.

### Thursdays

- 1110 VOA (as): Science Report (Special English). See W 0040.  
1115 VOA (as): The Making of a Nation (Special English). See H 0045.  
1120 Radio Australia: Variable Feature. See M 0410.  
1130 BBC: Drama, "Runyon's Guys and Dolls". "Palm Beach Santa Claus" (4th), "Broadway Incident" (11th), "A Piece of Pie" (18th), "So You Won't Talk" (25th).  
1130 Radio Australia: Lane's Company. See S 1530.

- 1130 VOA (as): Now Music U.S.A. (Top Ten). Top ten pop music hits of the week in the U.S.A.  
1145 Radio Bulgaria: Review of Current Affairs. See S 0415.

## Fridays

- 1110 VOA (as): Environment Report (Special English). A five-minute report on a specific environmental subject.
- 1115 VOA (as): American Mosaic (Special English). Reports about music, books, movies, and student life in the U.S.A.
- 1120 Radio Australia: Variable Feature. See M 0410.
- 1130 BBC: Meridian Books. See W 0630.
- 1130 Radio Australia: The Parliament Program. Roundup of events in the Australian Parliament.
- 1130 VOA (as): Country Music U.S.A.. Currently popular tunes with a generous sprinkling of old favorites. On Friday broadcasts of Music, U.S.A.
- 1145 Radio Bulgaria: Review of Current Affairs. See S 0415.

## Saturdays

- 1110 VOA (as): Agriculture Today. A weekly program about food,  
farming, and agricultural research.  
1120 Radio Australia: Variable Feature. See M 0410.  
1130 BBC: Meridian Reports. See W 0630.  
1130 Radio Australia: Business Weekly. See F 2310.  
1130 VOA (as): Press Conference U.S.A.. Reporters interview an  
interesting personality on a subject in the news.  
1145 Radio Bulgaria: Review of Current Affairs. See S 0415.



1200 UTC

**[7:00 AM EST/4:00 AM PST]**

## FREQUENCIES

1200-1300	Australia, AAF Radio	12070as			
1200-1300	Australia, ABC Brisbane	4920do			
1200-1300	Australia, ABC Perth	6140do	9610do		
1200-1230	Australia, Radio	6020pa	6080as	9710as	
1200-1300	Australia, Radio	5995pa	7240pa	9580pa	17910as
1200-1300 vl	Australia, VL8A Alice Spg	2310do			
1200-1300 vl	Australia, VL8K Katherine	2485do			
1200-1300 vl	Australia, VL8T Tent Crk	2325do			
1200-1300	Bahrain, Radio	6010do			
1200-1300	Brazil, Radiobras	15445am			
1200-1300	Bulgaria, Radio	11645eu	13645eu		
1200-1215	Cambodia, Natl Voice of	11938as			
1200-1300	Canada, CFCX Montreal	6005do			
1200-1300	Canada, CFRX Toronto	6070do			
1200-1300	Canada, CFVP Calgary	6030do			
1200-1300	Canada, CHNX Halifax	6130do			
1200-1300	Canada, CKZU Vancouver	6160do			
1200-1300	China, China Radio Intl	9715as	11660as	11795as	15210na
		15440na			
1200-1300	Costa Rica, AWR Alajuela	9725ca	11870ca		
1200-1300	Costa Rica, R Peace Intl	7375am	7385am	21465am	
1200-1300	Ecuador, HCJB Quito	11925am	15115am	17490am	17890am
		21455om			
1200-1230	Iran, VOIRI Tehran	9525me	11715me	11790me	11910as
		11930as			
1200-1300 vl	Italy, IRRS Milano	7125eu			
1200-1300	Kenya, Kenya BC Corp	4935do			
1200-1230 mtwhf	Lebanon, King of Hope	6280me			
1200-1300 vl	Malaysia, RTM Kota Kinaba	5980do			
1200-1300	Malaysia, RTM Radio 4	7295do			
1200-1300 vl	Malaysia, RTM Sarawak	4950do			
1200-1230 smwha	Mongolia, R Ulaanbaatar	11850as	12015as		
1200-1206	New Zealand, R NZ Intl	9700as			
1200-1300	Nigeria, Radio	4990do	7285do		
1200-1230 s	Norway, Radio Norway Intl	21705as	25730au		
1200-1300 mtwhf	Palau, KHBN Voice of Hope	9830as			
1200-1230 a	Palau, KHBN Voice of Hope	9830as			
1200-1300 vl	PNG, Natl BC	4890do			
1200-1300 vl	PNG, Radio Central	3290do			
1200-1300 vl	PNG, Radio Enga	2410do			
1200-1300 vl	PNG, Radio Milne Bay	3365do			
1200-1300 vl	PNG, Radio Western	3305do			

1200-1255	Poland, Polish R Warsaw	6135eu	7145eu	9525eu	11815eu
1200-1300	Russia, Radio Moscow Intl	11705af	11800me	11985af	15155as
		15280na	15440me	15455as	15470as
		15520na	15525na	15550me	15750na
		17595na	17645na	17705na	17760na
		17790na	17815me	21465me	21785me
1200-1300 vl	S Africa, Radio Oranje	9630do			
1200-1300	Singapore, SBC Radio One	5010do	5052do	11940do	
1200-1300	South Korea, Radio Korea	9640na			
1200-1230	Thailand, Radio	4830as	9655as	11905as	
1200-1300	United Kingdom,BBC London	6190af	6195am	9410eu	9515na
		9660eu	9740na	9750eu	9760eu
		11760me	11940af	12095eu	15070eu
		15220na	15310as	15400af	15575me
		17640eu	17705eu	17790af	17885af
		21470af	21660af		
1200-1300	USA, CSMonitor Boston MA	9425au	9495na	13625as	13760ca
1200-1300 as	USA, CSMonitor Boston MA	15665eu			
1200-1300	USA, KCBI Dallas TX	9815am			
1200-1300	USA, KTVB Salt Lk City UT	7510am			
1200-1300	USA, VOA Washington DC	6110as	9760as	11715as	15160as
		15425as			
1200-1300	USA, WEWN Birmingham AL	9350am	15695am		
1200-1300	USA, WHRI Noblesville IN	7315na	9850sa	11790sa	
1200-1300	USA, WJCR Upton KY	7490na	13595na		
1200-1300	USA, WWCN Nashville TN	13845am	15685am		
1200-1300	USA, WYFR Okeechobee FL	5950na	7355na	11830na	11970na
1200-1225	Uzbekhistan, R Tashkent	7285as	9715as	15295as	17815as
1207-1300 ocasnal	New Zealand, R NZ Intl	9510pa			
1215-1300	Egypt, Radio Cairo	17595as			
1220-1230 vl	Ghana, GBC Radio 1	4915do			
1230-1300	Austria, R Austria Intl	6155eu	13730na	15450as	
1230-1300	Bangladesh, Radio	13615eu	15220eu		
1230-1300	Canada, RCI Montreal	6150as	11730as		
1230-1300	Finland, Radio	11900na	15400na		
1230-1255	France, Radio France Intl	9805eu	11670eu	15155eu	15195eu
		15365na	17575na		
1230-1300	Ghana, GBC Radio 2	6130do	7295do		
1230-1300	Netherlands, Radio	5955eu	9650eu		
1230-1300	Sri Lanka, SLBC Colombo	6075as	9720as		
1230-1300	Sweden, Radio	15240pa	21500as		
1230-1300	USA, VOA Washington DC	11805as			
1230-1300	Vietnam, Voice of	9840as	12020as	15010as	

## SELECTED PROGRAMS

### Sundays

- 1201 BBC: Play of the Week. See S 0101.  
1210 Radio Australia: Study in Australia. See S 0010.  
1210 VOA (as): Encounter. A discussion program presenting  
opinions on the issues facing America and the world.  
1230 Radio Australia: Report from Asia. NEW! Correspondent  
reports on current Asian affairs.  
1230 VOA (as): Studio One. Dramatized, semi-dramatized, and  
narrative documentaries. Subjects range from personality  
profiles to reviews of historic events.

### **Mondays**

- 1209 BBC: Words of Faith. People of all faiths share how their  
scripture gives authority and meaning to their lives.
- 1210 Radio Australia: Variable Feature. See M 0410.
- 1210 VOA (as): Newline. See M 0010.
- 1215 BBC: Quiz. "Hoax". NEW! Guess which extraordinary tale is  
the true one.
- 1230 Radio Australia: International Report. See M 0030.
- 1230 VOA (as): Magazine Show. Features about culture, science,  
sports, medicine, and the arts in America.
- 1245 BBC: Sports Roundup. See S 0315.

## Tuesdays

- 1209 BBC: Words of Faith. See M 1209.  
1210 Radio Australia: Variable Feature. See M 0410.  
1210 VOA (as): Newslines. See M 0010.  
1215 BBC: Multitrack 1: Top 20. See M 2330.  
1230 Radio Australia: International Report. See M 0030.  
1230 VOA (as): Magazine Show. See M 1230.  
1245 BBC: Sports Roundup. See S 0315.

### Wednesdays

- 1210 Radio Australia: Variable Feature. See M 0410.  
1210 VOA (as): Newslines. See M 0010.  
1215 BBC: New Ideas. See M 1615.  
1230 Radio Australia: International Report. See M 0030.  
1230 VOA (as): Magazine Show. See M 1230.  
1235 BBC: Special Feature. See M 1635.  
1245 BBC: Sports Roundup. See S 0315.

### Thursdays

- 1209 BBC: Words of Faith. See M 1209.  
1210 Radio Australia: Variable Feature. See M 0410.  
1210 VOA (as): Newslines. See M 0010.  
1215 BBC: Multitrack 2. See W 2330.

- 1230 Radio Australia: International Report. See M 0030.  
1230 VOA (as): Magazine Show. See M 1230.  
1245 BBC: Sports Roundup. See S 0315.

## Fridays

- 1209 BBC: Words of Faith. See M 1209.  
1210 Radio Australia: Variable Feature. See M 0410.  
1210 VOA (as): Newsline. See M 0010.  
1215 BBC: Feature. "The World's Policemen" (5th,12th). How  
budget cuts will affect American military at home and world-  
wide.  
1230 Radio Australia: International Report. See M 0030.  
1230 VOA (as): Magazine Show. See M 1230.  
1245 BBC: Sports Roundup. See S 0315.

### Saturdays

- 1209 BBC: Words of Faith. See M 1209.  
1210 Radio Australia: Variable Feature. See M 0410.  
1215 BBC: Multitrack 3. See F 2330.  
1230 Radio Australia: Background Report. NEW! Interviewing an expert on international affairs.  
1230 VOA (as): Weekend Magazine. A look at people and places in the U.S., featuring music and popular culture.  
1245 BBC: Sports Roundup. See S 0315.



1300 UTC

[8:00 AM EST/5:00 AM PST]

## FREQUENCIES

1300-1400	Australia, ABC Brisbane	4920do			
1300-1400	Australia, ABC Perth	9610do			
1300-1400	Australia, Radio	5995pa	7240pa	9580pa	11800pa
1300-1400 vl	Australia, VL8A Alice Spg	2310do			
1300-1400 vl	Australia, VL8K Katherine	2485do			
1300-1400 vl	Australia, VL8T Tent Crk	2325do			
1300-1400	Bahrain, Radio	6010do			
1300-1320	Brazil, Radiobras	15445am			
1300-1400	Canada, CFCX Montreal	6005do			
1300-1400	Canada, CFRX Toronto	6070do			
1300-1400	Canada, CFVP Calgary	6030do			
1300-1400	Canada, CHNX Halifax	6130do			
1300-1400	Canada, CKZU Vancouver	6160do			
1300-1400	China, China Radio Intl	7405na	9715as	11660as	15440pa
1300-1400	Costa Rica, R Peace Intl	7375am	7385am	21465am	
1300-1400	Ecuador, HCJB Quito	11925am	15115am	17490am	17890am
		21455am			
1300-1330	Egypt, Radio Cairo	17595as			
1300-1400 as	Finland, Radio	15400na	21550na		
1300-1330	Ghana, GBC Radio 1	4915do			
1300-1400 vl	Italy, IRRS Milano	7125as			
1300-1325	Kenya, Kenya BC Corp	4935do			
1300-1400 vl	Malaysia, RTM Kota Kinabalu	5980do			
1300-1400	Malaysia, RTM Radio 4	7295do			
1300-1400 vl	Malaysia, RTM Sarawak	4950do			
1300-1400 ocasnl	New Zealand, R NZ Intl	9510pa			
1300-1400	Nigeria, Radio	4990do	7285do		
1300-1350	North Korea, R Pyongyang	9345eu	9640as	11740as	15230as
1300-1400 mtwhf	Palau, KHBV Voice of Hope	9830as			
1300-1400	Philippines, FEBC Manila	11995as			
1300-1400 vl	PNG, Natl BC	4890do			
1300-1400	Romania, R Romania Intl	11940eu	15365eu	17720eu	17850eu
1300-1400	Russia, AWR Russia	11855au			
1300-1400	Russia, Radio Moscow Intl	9825am	9885am	9895am	11705as
		11985as	15125na	15440as	15455as
		15470me	15480as	15550as	17570me
		17595me	17705as	17760as	17790as
		21785me			
1300-1400 vl	S Africa, Radio Oranje	9630do			
1300-1400	Singapore, SBC Radio One	5010do	5052do	11940do	
1300-1330	South Korea, Radio Korea	9750as	13670as		

1300-1400	Sri Lanka, SLBC Colombo	6075as	9720as		
1300-1330	Switzerland, Swiss R Intl	7480as	11690as	13635as	15505as
		17670as	21770as		
1300-1400	United Kingdom, BBC London	6190af	6195am	9410eu	9515na
		9660eu	9740na	9750eu	9760eu
		11760me	11820na	11940af	12095eu
		15070eu	15220na	15310as	15400af
		15420af	15575me	17640eu	17705eu
		17790af	17885af	21470af	21660af
1300-1400	USA, CSMonitor Boston MA	9495na	13625as		
1300-1400 as	USA, CSMonitor Boston MA	15665eu			
1300-1400 irreg	USA, KJES Mesquite NM	11715am			
1300-1400	USA, KNLS Anchor Point AK	7355as			
1300-1400	USA, KTNB Salt Lk City UT	7510am			
1300-1400	USA, VOA Washington DC	6110as	9760as	15160as	15425as
1300-1330	USA, VOA Washington DC	11715as	11805as		
1300-1400	USA, WEWN Birmingham AL	9350na			
1300-1400	USA, WHRI Noblesville IN	9465na	11790na		
1300-1400	USA, WJCR Upton KY	7490na	13595na		
1300-1400	USA, WWCR Nashville TN	13845am	15685am		
1300-1400	USA, WYFR Okeechobee FL	5950na	9705na	11550as	11830na
		11970na	13695na		
1302-1400	Taiwan, VO Free China	11550as			
1315-1325	Nepal, Radio	3230do	5005do	7165do	
1325-1400 mtwhf	Kenya, Kenya BC Corp	4935do			
1330-1400	Austria, R Austria Intl	15450as			
1330-1355 mtwfa	Belgium, R Vlaanderen Int	17555na	21810na		
1380-1400	Bulgaria, Radio	11630as			
1330-1357	Canada, RCI Montreal	6150as	9435as		
1330-1400 mtwhf	Finland, Radio	11900na	15400na	21550na	
1330-1400 tw	Ghana, GBC Radio 1	4915do			
1330-1400	India, All India Radio	11760as	15120as		
1330-1400	Laos, National Radio of	7116as			
1330-1400	Netherlands, Radio	9895as	13700as	15530as	
1330-1400	Turkey, Voice of	9675as			
1330-1400	UAE, UAE Radio Dubai	13675eu	15320eu	15435as	21605as
1330-1355	Uzbekistan, R Tashkent	7285as	9715as	15295as	17815as
1330-1400	Vietnam, Voice of	9840as	15010as		
1345-1400 vl	Myanmar, Radio	7185do			
1345-1400	Vatican State, Vatican R	15090as	17525as		

## SELECTED PROGRAMS

## Sundays

- 1310 Radio Australia: Sports Report. Results and reports from the Asia/Pacific region, and international events.  
 1310 VOA (as): Critic's Choice. News from the world of the arts.  
 1330 Radio Australia: The Europeans. See S 0130.  
 1340 VOA (as): Words and Their Stories (Special English). See S 0040.  
 1345 VOA (as): Tuning in the USA (Special English). See S 0045.

## Mondays

- 1310 Radio Australia: Sports Report. See S 1310.  
 1310 VOA (as): Focus. The major figures and issues that shape our world.  
 1330 Radio Australia: World of Country Music. The latest chart makers and top albums.  
 1340 VOA (as): Development Report (Special English). See M 0040.  
 1345 VOA (as): This is America (Special English). See S 1645.

## Tuesdays

- 1310 Radio Australia: Sports Report. See S 1310.  
 1310 VOA (as): Focus. See M 1310.  
 1330 Radio Australia: Jazz Notes. The best of Australian jazz.  
 1340 VOA (as): Agriculture Report (Special English). See T 1110.

- 1345 VOA (as): Science in the News (Special English). See T 1115.

## Wednesdays

- 1310 Radio Australia: Sports Report. See S 1310.  
 1310 VOA (as): Focus. See M 1310.  
 1330 Radio Australia: Blacktracker. Traditional and contemporary aboriginal music.  
 1340 VOA (as): Science Report (Special English). See W 0040.  
 1345 VOA (as): Space and Man (Special English). See W 0045.

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## Thursdays

- 1310 Radio Australia: Sports Report. See S 1310.  
 1310 VOA (as): Focus. See M 1310.  
 1330 Radio Australia: Music Deli. Paul Petran and Stephen Snelleman present music from a variety of cultures.  
 1340 VOA (as): Science Report (Special English). See W 0040.  
 1345 VOA (as): The Making of a Nation (Special English). See H 0045.

## Fridays

- 1310 Radio Australia: Sports Report. See S 1310.  
 1310 VOA (as): Focus. See M 1310.  
 1330 Radio Australia: Music Deli. Paul Petran and Stephen Snelleman present music from a variety of cultures.  
 1340 VOA (as): Environment Report (Special English). See F 1110.  
 1345 VOA (as): American Mosaic (Special English). See F 1115.

## Saturdays

- 1310 Radio Australia: Sports Report. See S 1310.  
 1310 VOA (as): On the Line. A discussion of U.S. policies and contemporary issues.  
 1330 Radio Australia: The Parliament Program. See F 1130.  
 1340 VOA (as): In the News (Special English). See A 0040.  
 1345 VOA (as): American Stories (Special English). Readings of short stories by American authors in slow English.



1400 UTC

**[9:00 AM EST/6:00 AM PST]**

## FREQUENCIES

1400-1450	Australia, AAF Radio	13508af			
1400-1500	Australia, ABC Brisbane	4920do			
1400-1500	Australia, ABC Perth	6140do			
1400-1500	Australia, Radio	5995pa	7240pa	9580pa	11800pa
1400-1500 vl	Australia, VL8A Alice Spg	2310do			
1400-1500 vl	Australia, VL8K Katherine	2485do			
1400-1500 vl	Australia, VL8T Tent Crk	2325do			
1400-1500	Bahrain, Radio	6010do			
1400-1425 mtwhfa	Belgium, R Vlaanderen Int	17555na			
1400-1500	Bulgaria, Radio	11630as			
1400-1500	Canada, CFCX Montreal	6005do			
1400-1500	Canada, CFRX Toronto	6070do			
1400-1500	Canada, CFVP Calgary	6030do			
1400-1500	Canada, CHNX Halifax	6130do			
1400-1500	Canada, CKZU Vancouver	6160do			
1400-1500	China, China Radio Intl	7405na	11815as	15165as	
1400-1500	Costa Rica, R Peace Intl	7375am	7385am		
1400-1430	Ecuador, HCJB Quito	11925am	15115am	17490am	17890am
		21455am			
1400-1500	France, Radio France Intl	11910as	17650me	17695eu	
1400-1420	Ghana, GBC Radio 1	4915do			
1400-1500	Ghana, GBC Radio 2	6130do	7295do		
1400-1500 mtwhfa	Honduras, R Copan Intl	15675am			
1400-1500	India, All India Radio	11760as	15120as		
1400-1425 mtwh	Israel, Kol Israel	15640na	15650na		
1400-1500 vl	Italy, IRRS Milano	7125as			
1400-1500	Japan, NHK/Radio Japan	9535am	9750am	11735as	11815as
		11865am			
1400-1500	Jordan, Radio	9560eu			
1400-1500 mtwhf	Kenya, Kenya BC Corp	4935do			
1400-1500 vl	Malaysia, RTM Kota Kinaba	5980do			
1400-1500	Malaysia, RTM Radio 4	7295do			
1400-1500 vl	Malaysia, RTM Sarawak	4950do	7160do		
1400-1500	Malta, V of Mediterranean	11925eu			
1400-1500 mtwhf	Morocco, RTV Marocaine	17595af			
1400-1500 vl	Myanmar, Radio	7185do			
1400-1500 ocasnal	New Zealand, R NZ Intl	9510pa			
1400-1430 mtwhf	Palau, KHBN Voice of Hope	9830as			
1400-1500	Philippines, FEBC Manila	11995as			
1400-1500 vl	PNG, Natl BC	4890do			
1400-1500	Russia, Radio Moscow Intl	7315as	7355as	9705am	11705as

		11940as 15455af 17760am	11995am 15480as 17790am	15110as 15500as	15125af 17570af
1400-1500 vl	Rwanda, Radiodiff Rwanda	9610do			
1400-1500 vl	S Africa, Radio Oranje	9630do			
1400-1500	Singapore, SBC Radio One	5010do	5052do	11940do	
1400-1500	South Korea, Radio Korea	5975as	6135as		
1400-1500	Sri Lanka, SLBC Colombo	6075as	9720as		
1400-1500	United Kingdom, BBC London	6190af 9660eu 15070eu 15575me 17840na	6195am 9760eu 15260na 17640af 17880af	9410eu 11940af 15310as 17705eu 21470af	9515na 12095eu 15400af 17790af 21660af
1400-1500	USA, CSMonitor Boston MA	9530as			
1400-1500 sa	USA, CSMonitor Boston MA	13710na			
1400-1500	USA, KCBi Dallas TX	15375am			
1400-1500	USA, KJES Mesquite NM	11715na			
1400-1500	USA, KTVN Salt Lk City UT	7510na			
1400-1500	USA, WOA Washington DC	6110as 15255eu	7125as 15395as	9760as 15425as	15160as
1400-1500	USA, WEWN Birmingham AL	9350na			
1400-1500	USA, WHRI Noblesville IN	9465na	15105na		
1400-1500	USA, WJCR Upton KY	7490na	13595na		
1400-1500	USA, WWCN Nashville TN	13845am	15685am		
1400-1500	USA, WYFR Okeechobee FL	9705na	11550as	11830na	17760na
1400-1405	Vatican State, Vatican R	15090au	17525au		
1415-1500	Bhutan, BC Service	5025do			
1415-1425	Nepal, Radio	3230do	5005do	7165do	
1430-1500	Afghanistan, Radio	7200as			
1430-1500	Albania, R Tirana Intl	7155na	9760na		
1430-1500	Australia, Radio	6060pa 11680as	6080as	7260as	9510as
1430-1500	Canada, RCI Montreal	9555eu 15325me	11915af 17820af	11935me	15315eu
1430-1500	Ecuador, HCJB Quito	11925am	17490am	17890am	21455am
1430-1500 m	Indonesia, RRI Padang	4003pa			
1430-1500	Myanmar, Radio	5990do			
1430-1500	Netherlands, Radio	9895as	13700as	15150as	
1430-1500 mtwhf	Portugal, Radio	21515me			
1430-1500	Romania, R Romania Intl	11775as	15335as	17720as	
1430-1500 vl	Uganda, Radio	4976do			
1435-1445	Greece, Voice of	15630na	17525as		
1445-1500 smha	Monqolia, R Ulaanbaatar	13780as			

## SELECTED PROGRAMS

### Sundays

- 1401 BBC: Feature. "Making America". "A Nation Divided" (7th),  
"Trails West" (14th), "Dollars and Depressions" (21st), "The  
Movie" (28th).  
1410 Radio Australia: Study in Australia. See S 0010.  
1410 VOA (as): The Concert Hall. Classical music and interviews  
with America's great artists and conductors.  
1430 BBC: "Anything Goes." A variety of music and much more with  
Bob Holness.  
1430 Radio Australia: Report from Asia. See S 1230.  
1455 VOA (as): VOA Editorial. Comments expressing the official  
position of the U.S. Government on various subjects.

## Mondays

- 1400 BBC (as): Dateline East Asia. Magazine program dealing  
with political and economic affairs of SE/NE Asia.
- 1405 BBC: Outlook. An up-to-the-minute mix of conversation,  
controversy and color from around the world.
- 1410 Radio Australia: Variable Feature. See M 0410.
- 1410 VOA (as): Asia Report. Major news developments in the  
region and throughout the world.
- 1430 BBC (as): Special Programs for Asia. English-teaching  
followed by world news at slow speed.
- 1430 BBC: Off the Shelf. See M 0430.
- 1430 Radio Australia: International Report. See M 0030.
- 1445 BBC: Feature. "American Icons" (from 8th). See S 0445.
- 1448 Radio Australia: Stock Exchange Report. Financial news  
from Sydney and other exchanges.

- 1455 VOA (as): VOA Editorial. See S 1455.

## Tuesdays

- 1400 BBC (as): Dateline East Asia. See M 1400.  
1405 BBC: Outlook. See M 1405.  
1410 Radio Australia: Variable Feature. See M 0410.  
1410 VOA (as): Asia Report. See M 1410.  
1430 BBC (as): Special Programs for Asia. See M 1430.  
1430 BBC: Off the Shelf. See M 0430.  
1430 Radio Australia: International Report. See M 0030.  
1445 BBC: Classical Music Feature. See M 0145.  
1448 Radio Australia: Stock Exchange Report. See M 1448.  
1455 VOA (as): VOA Editorial. See S 1455.

### Wednesdays

- 1400 BBC (as): Dateline East Asia. See M 1400.  
1405 BBC: Outlook. See M 1405.  
1410 Radio Australia: Variable Feature. See M 0410.  
1410 VOA (as): Asia Report. See M 1410.  
1430 BBC: Off the Shelf. See M 0430.  
1430 Radio Australia: International Report. See M 0030.  
1445 BBC: Good Books. Recommendation of a book to read.  
1448 Radio Australia: Stock Exchange Report. See M 1448.  
1455 VOA (as): VOA Editorial. See S 1455.

### Thursdays

- 1400 BBC (as): Dateline East Asia. See M 1400.  
1405 BBC: Outlook. See M 1405.

- 1410 Radio Australia: Variable Feature. See M 0410.  
1410 VOA (as): Asia Report. See M 1410.  
1430 BBC (as): Special Programs for Asia. See M 1430.  
1430 BBC: Off the Shelf. See M 0430.  
1430 Radio Australia: International Report. See M 0030.  
1445 BBC: The Learning World. See M 0615.  
1448 Radio Australia: Stock Exchange Report. See M 1448.  
1455 VOA (as): VOA Editorial. See S 1455.

## Fridays

- 1400 BBC (as): Dateline East Asia. See M 1400.  
1405 BBC: Outlook. See M 1405.  
1410 Radio Australia: Variable Feature. See M 0410.  
1410 VOA (as): Asia Report. See M 1410.  
1430 BBC (as): Special Programs for Asia. See M 1430.  
1430 BBC: Off the Shelf. See M 0430.  
1430 Radio Australia: International Report. See M 0030.  
1445 BBC: Global Concerns. See F 0145.  
1448 Radio Australia: Stock Exchange Report. See M 1448.  
1455 VOA (as): VOA Editorial. See S 1455.

### Saturdays

- 1401 BBC: Sportsworld. The weekly sports magazine.  
1410 Radio Australia: Variable Feature. See M 0410.  
1410 VOA (as): Music U.S.A. (Jazz). Willis Conover hosts the  
VOA jazz hour.  
1430 Radio Australia: Background Report. See A 1230.  
1455 VOA (as): VOA Editorial. See S 1455.



1500 UTC

**[10:00 AM EST/7:00 AM PST]**

## FREQUENCIES

1500-1600	Australia, ABC Brisbane	6140do								11705me	11875me	11940me	15125as
1500-1600	Australia, Radio	5995pa 7260as 11800pa	6060pa 9510as	6080as 9580pa	7240pa 11680as					15180as 15290as 15550am	15770am		17760am
1500-1600 vl	Australia, VLBA Alice Spg	2310do				1500-1600 vl	Rwanda, Radiodiff Rwanda			9610do			
1500-1600 vl	Australia, VL8K Katherine	2485do				1500-1600 mtwtfs	S Africa, Radio Oranje			4875do			
1500-1600 vl	Australia, VLBT Tent Crk	2325do				1500-1600	Seychelles, FEBA Radio			9810as	15330as		
1500-1600	Bahrain, Radio	6010do				1500-1600	Singapore, SBC Radio One			5010do	5052do	11940do	
1500-1600	Canada, CFCX Montreal	6005do				1500-1600	Sri Lanka, SLBC Colombo			6075as	9720as		
1500-1600	Canada, CFRX Toronto	6070do				1500-1530	Sweden, Radio			15190na	15240na	21500na	
1500-1600	Canada, CFVP Calgary	6030do				1500-1530	Switzerland, Swiss R Intl			13635af	15505af	17670af	21770af
1500-1600	Canada, CHNX Halifax	6130do				1500-1600 vl	Uganda, Radio			4976do			
1500-1600	Canada, CKZU Vancouver	6160do				1500-1600	United Kingdom,BBC London			6190af	6195eu	9410eu	9515na
1500-1600	China, China Radio Intl	11815as	15165as							9740me	9750eu	9760eu	11940af
1500-1600	Costa Rica, R Peace Intl	7375am	7385am	21465am						12095eu	15070af	15260na	15420af
1500-1527	Czech Republic, R Prague	6055eu 15605af	7345eu 17353eu	13600me	15535af	1500-1600	USA, CSMonitor Boston MA			9530as			
1500-1600	Ecuador, HCJB Quito	11925am	17490va	17890am	21455am	1500-1600	USA, KCBI Dallas TX			15375am			
1500-1600	Ethiopia, Voice of	7165do	9560do			1500-1600	USA, KTNB Salt Lk City UT			15590na			
1500-1550	Germany, Deutsche Welle	17185af 17735af	9735af 21600as	11965af	13610af	1500-1600	USA, VOA Washington DC			6110as 9760as	7125as 15205af	9690as 15255eu	9700as 15395as
1500-1600	Guam, KTWR Agana	15610as				1500-1600	USA, WEWN Birmingham AL			17510am			
1500-1600 vl	Italy, IRRS Milano	7125va				1500-1600	USA, WHRI Noblesville IN			9465sa	15105na		
1500-1600	Japan, NHK/Radio Japan	9750as	11815as	11865na	15355af	1500-1600	USA, WJCR Upton KY			7490na	13595na		
1500-1600	Jordan, Radio	9560eu				1500-1600	USA, WRNO New Orleans LA				15420na		
1500-1600 vl	Malaysia, RTM Kota Kinaba	5980do				1500-1600	USA, WWCR Nashville TN			13845am	15685am		
1500-1600	Malaysia, RTM Radio 4	7295do				1500-1600	USA, WYFR Okeechobee FL			11830na	15215na	17760na	
1500-1600 vl	Malaysia, RTM Sarawak	4950do	7160do			1515-1600	Bulgaria, Radio			12085			
1500-1600	Malta, V of Mediterranean	11925eu				1530-1600	Austria, R Austria Intl			6155eu	9880me	11780as	13730eu
1500-1513 smha	Mongolia, R Ulaanbaatar	13780as				1530-1545	Finland, Radio			6120eu	11755eu	11820eu	15240me
1500-1600 ocasnal	New Zealand, R NZ Intl	9510pa								21550af			
1500-1600	Nigeria, Radio	4990do	7285do			1530-1600	Georgia, Georgian Radio			11910eu			
1500-1600	Nigeria, Voice of	7255af				1530-1600	Netherlands, Radio			9895as	13770as	15150as	
1500-1600	North Korea, R Pyongyang	9325eu	9640af	9977af	13785eu	1530-1600 vl	Russia, Radio Centre			15185eu			
1500-1600	Philippines, FEBC Manila	11995sas				1530-1600 irreg	Tanzania, Radio			11765af			
1500-1600 vl	PNG, Natl BC	4890do				1530-1600	USA, VOA Washington DC			7215as			
1500-1555	Poland, Polish R Warsaw	7285eu	9525eu	11840eu		1545-1600	Vatican State, Vatican R			11640as	15090au		
1500-1530	Romania, R Romania Intl	11775as	15335as	17720as									
1500-1600	Russia, Radio Moscow Intl	9755am	9825am	9895na	11675me								

## SELECTED PROGRAMS

### Sundays

- 1500 BBC (af): Postmark Africa. See S 0335.  
1510 VOA (as): New Horizons. See S 1110.  
1515 BBC: Concert Hall. Classical music concerts.  
1530 Radio Australia: Lane's Company. Terry Lane in conversation with people from all walks of life.  
1530 VOA (as): Studio One. See S 1230.  
1530 Voice of Nigeria: In the News. Fifteen minutes of the news behind the news.

### Mondays

- 1500 Voice of Nigeria: Images of Nigeria. See S 1645.  
1510 Radio Australia: Asia Focus. NEW! Reporting on the commercial interrelationships of the Asia/Pacific Region.  
1510 VOA (as): Newslines. See M 0010.  
1515 BBC (af): Focus on Africa. Up-to-the-minute reports on the day's events from all over the continent.  
1515 BBC: Special Feature. "Cowboys" (22nd). NEW! Nick Rankin travels to Texas and Wyoming in search of "cowboy culture".  
1515 BBC: Special Feature. "The Sioux" (29th). NEW! A look at life for modern-day native Americans.  
1515 BBC: Special Feature. See M 0101.  
1530 BBC: Special Feature. "Kennedy's Been Shot" (15th). A traumatic event recreated as it was reported 30 years ago.  
1530 BBC: Special Feature. "Turning a Blind Eye" (1st, 8th). The political and economic impact of "hot" money.  
1530 Radio Australia: Innovations. See M 1130.

- 1530 VOA (as): Magazine Show. See M 1230.  
1530 Voice of Nigeria: 60 Minutes. World and Nigerian news, correspondent reports, press review, and sports.

## Tuesdays

- 1510 Radio Australia: Asia Focus. See M 1510.  
1510 VOA (as): Newslne. See M 0010.  
1515 BBC (af): Focus on Africa. See M 1515.  
1515 BBC: A Jolly Good Show. Dave Lee Travis presents your  
record requests and dedications in his own unique way.  
1530 Radio Australia: Communicator. See T 1130.  
1530 VOA (as): Magazine Show. See M 1230.  
1530 Voice of Nigeria: 60 Minutes. See M 1530.

### Wednesdays

- 1510 Radio Australia: Asia Focus. See M 1510.  
1510 VOA (as): Newline. See M 0010.  
1515 BBC (af): Focus on Africa. See M 1515.  
1515 BBC: Special Feature. See M 0415.  
1530 BBC: Feature: "The Voices of America". NEW! Spotlight on various programs taken from American Public Radio.  
1530 Radio Australia: Science File. See W 1130.  
1530 VOA (as): Magazine Show. See M 1230.  
1530 Voice of Nigeria: 60 Minutes. See M 1530.

### Thursdays

- 1510 Radio Australia: Asia Focus. See M 1510.

- 1510 VOA (as): Newslines. See M 0010.  
1515 BBC (af): Focus on Africa. See M 1515.  
1515 BBC: Ray on Record. See S 2315.  
1530 VOA (as): Magazine Show. See M 1230.  
1530 Voice of Nigeria: 60 Minutes. See M 1530.

## Fridays

- 1510 Radio Australia: Asia Focus. See M 1510.  
1510 VOA (as): Newslines. See M 0010.  
1515 BBC (af): Focus on Africa. See M 1515.  
1515 BBC: Music Review. See H 2315.  
1530 Radio Australia: The Parliament Program. See F 1130.  
1530 VOA (as): Magazine Show. See M 1230.  
1530 Voice of Nigeria: 60 Minutes. See M 1530.

### Saturdays

- 1500 BBC (af): Spice Taxi. See A 0630.  
1510 Radio Australia: Variable Feature. See M 0410.  
1510 VOA (as): Newslne. See M 0010.  
1515 BBC: Sportsworld. See A 1401.  
1530 Radio Australia: Business Weekly. See F 2310.  
1530 VOA (as): Press Conference U.S.A. See A 1130.  
1530 Voice of Nigeria: 60 Minutes. See M 1530.



## 1600 UTC

[11:00 AM EST/8:00 AM PST]

## FREQUENCIES

1600-1700	Australia, Radio	5995pa	7240pa	7260as	9510as	1600-1700	Saudi Arabia, BSKSA	9705eu	9720eu		
		9580pa	11680as	11695pa		1600-1605	Singapore, SBC Radio One	5010do	5052do	11940do	
1600-1700 vl	Australia, VL8A Alice Spg	2310do				1600-1700	South Korea, Radio Korea	4945af	5975as	15220af	
1600-1700 vl	Australia, VL8K Katherine	2485do				1600-1700	Sri Lanka, SLBC Colombo	6075as	9720as		
1600-1700 vl	Australia, VL8T Tent Crk	2325do				1600-1700	Swaziland, Trans World R	9500af			
1600-1700	Bahrain, Radio	6010do				1600-1700 irreg	Tanzania, Radio	11765af			
1600-1700	Bulgaria, Radio	12085				1600-1645	UAE, UAE Radio Dubai	11795af	13675eu	15435eu	21605eu
1600-1700	Canada, CFCX Montreal	6005do				1600-1700 vl	Uganda, Radio	4976do			
1600-1700	Canada, CFRX Toronto	6070do				1600-1700	United Kingdom, BBC London	6190af	6195eu	9410eu	9515na
1600-1700	Canada, CFVP Calgary	6030do						9630af	9740me	9750eu	9760eu
1600-1700	Canada, CHNX Halifax	6130do						11940af	12095eu	15070af	15260na
1600-1700	Canada, CKZU Vancouver	6160do						15420af	17640af	17840na	17860af
1600-1700	China, China Radio Intl	11575af	15110af	15130af				17880af	21470af	21660af	
1600-1700	Costa Rica, R Peace Intl	7375am	7385am	21465am		1600-1700	USA, CSMonitor Boston MA	13625af			
1600-1627	Czech, R Prague	6055me	7435af	13600me	15605af	1600-1700 sa	USA, CSMonitor Boston MA	13710na	17555na		
		17535af				1600-1700	USA, KCBI Dallas TX	15375am			
1600-1700	Ecuador, HCJB Quito	21455am				1600-1700	USA, KTNB Salt Lk City UT	15590am			
1600-1700	France, Radio France Intl	6175eu	11705af	12015af	15530me	1600-1700	USA, VOA Washington DC	7125as	9700as	9760as	11920af
		17620af	17795af	17850af				11995af	13710af	15205af	15225af
1600-1650	Germany, Deutsche Welle	6170as	7225as	9875as	15105as			15395as	15445af	17885af	17895af
		15595as	17810as	21680as		1600-1700	USA, WEWN Birmingham AL	17535na			
1600-1700	Guam, KSDA AWR Agat	7455as				1600-1700	USA, WHRI Noblesville IN	9465na	13760na	15105na	
1600-1645	Guam, KTWB Agana	15610as				1600-1700	USA, WJCR Upton KY	7490na	13595na		
1600-1700 vl	Italy, IRRS Milano	7125as				1600-1700	USA, WRNO New Orleans LA		15420na		
1600-1630	Jordan, Radio	9560eu				1600-1700	USA, WWCR Nashville TN	13845am	15685am		
1600-1700 s	Lebanon, King of Hope	6280me				1600-1700	USA, WYFR Okeechobee FL	11830na	15215na	15355eu	17760na
1600-1615 mha	Mongolia, R Ulaanbaatar	7560as	7780as					21525af	21615af		
1600-1649 ocasnal	New Zealand, R NZ Intl	9510pa				1600-1630	Vatican State, Vatican R	6245eu	7250eu	15090as	17865as
1600-1700	Nigeria, Radio	4990do				1600-1630 a	Vatican State, Vatican R	15090af	17730af		
1600-1700	Nigeria, Voice of	7255af				1600-1630	Vietnam, Voice of	9840af	12020af	15010af	
1600-1700	Pakistan, Radio	11570me	13590me	15515af	15555me	1600-1630	Yemen, Radio TV Corp	5970eu	7190eu		
		15675me	17725af			1615-1645	Sweden, Radio	6065eu			
1600-1700 vl	PNG, Natl BC	4890do				1630-1700	Australia, Radio	6060pa	11880pa		
1600-1700	Russia, Radio Moscow Intl	7180as	9825eu	9880eu	9895eu	1630-1657	Canada, RCI Montreal	7150as	9550as		
		11705am	11875am	11940am	15125as	1630-1700	Ecuador, HCJB Quito	17790me	21455me	21480me	
		15180na	15290na	15550af	17760na	1630-1700	Egypt, Radio Cairo	15255af			
		17790na				1645-1700 s	Guam, KTWB Agana	15610as			
1600-1700 vl	Rwanda, Radiodiff Rwanda	9610do				1645-1700	Tajikistan, Radio	7245as			
1600-1700	S Africa, Channel Africa	4945af				1650-1700 mtwtf	New Zealand, R NZ Intl	9550pa			
1600-1700 vl	S Africa, Radio Oranje	4875do									

## SELECTED PROGRAMS

## Sundays

- 1600 Voice of Nigeria: VoN-Linkup. See S 0505.  
 1610 VOA (as): Encounter. See S 1210.  
 1615 BBC: Feature. NEW! The story of religion in America.  
 1615 BBC: Feature. See S 0230.  
 1630 Radio Australia: Fine Music Australia. See S 1130.  
 1640 VOA (as): Words and Their Stories (Special English). See S 0040.  
 1645 BBC: Letter from America. See S 0615.  
 1645 VOA (as): This is America (Special English). Informative reports on life in the United States.  
 1645 Voice of Nigeria: Images of Nigeria. Tourist attractions in Nigeria.

## Mondays

- 1610 Radio Australia: Sports Report. See S 1310.  
 1610 VOA (as): Focus. See M 1310.  
 1615 BBC: New Ideas. Window on the world of technology, innovation and new products.  
 1630 Radio Australia: International Report. See M 0030.  
 1635 BBC: Special Feature. "Perfectly Proportioned". A look at religious and inspiring places.  
 1640 VOA (as): Development Report (Special English). See M 0040.  
 1645 BBC: The World Today. Examines thoroughly a topical aspect of the international scene.

- 1645 VOA (as): This is America (Special English). See S 1645.

## Tuesdays

- 1610 Radio Australia: Sports Report. See S 1310.  
 1610 VOA (as): Focus. See M 1310.  
 1615 BBC: Megamix. See T 1130.  
 1630 Radio Australia: International Report. See M 0030.  
 1640 VOA (as): Agriculture Report (Special English). See T 1110.  
 1645 BBC: The World Today. See M 1645.  
 1645 VOA (as): Science in the News (Special English). See T 1115.

## Wednesdays

- 1610 Radio Australia: Sports Report. See S 1310.  
 1610 VOA (as): Focus. See M 1310.  
 1615 BBC: Music Feature. See T 0630.  
 1630 Radio Australia: International Report. See M 0030.  
 1640 VOA (as): Science Report (Special English). See W 0040.  
 1645 BBC: The World Today. See M 1645.  
 1645 VOA (as): Space and Man (Special English). See W 0045.

## Thursdays

- 1610 Radio Australia: Sports Report. See S 1310.  
 1610 VOA (as): Focus. See M 1310.  
 1615 BBC: Network UK. Issues and events affecting the lives of people throughout the UK.

- 1630 Radio Australia: International Report. See M 0030.  
 1640 VOA (as): Science Report (Special English). See W 0040.  
 1645 BBC: The World Today. See M 1645.  
 1645 VOA (as): The Making of a Nation (Special English). See H 0045.

## Fridays

- 1610 Radio Australia: Sports Report. See S 1310.  
 1610 VOA (as): Focus. See M 1310.  
 1615 BBC: Science in Action. The latest in science and technology.  
 1630 Radio Australia: International Report. See M 0030.  
 1640 VOA (as): Environment Report (Special English). See F 1110.  
 1645 BBC: The World Today. See M 1645.  
 1645 VOA (as): American Mosaic (Special English). See F 1115.

## Saturdays

- 1610 Radio Australia: Sports Report. See S 1310.  
 1615 BBC: Sportsworld. See A 1401.  
 1630 Radio Australia: Background Report. See A 1230.  
 1640 VOA (as): In the News (Special English). See A 0040.  
 1645 VOA (as): American Stories (Special English). See A 1345.



## 1700 UTC [12:00 PM EST/9:00 AM PST]

1700-1800	Australia, Radio	5995pa	6060pa	6080as	7240pa
		7260as	9510as	9580pa	11680as
2000-2100 vl	Australia, VL8A Alice Spg	2310do			
2000-2100 vl	Australia, VL8K Katherine	2485do			
2000-2100 vl	Australia, VL8T Tent Crk	2325do			
1700-1800	Bahrain, Radio		6010do		
1700-1800	Canada, CFCX Montreal	6005do			
1700-1800	Canada, CFRX Toronto	6070do			
1700-1800	Canada, CFVP Calgary	6030do			
1700-1800	Canada, CHNX Halifax	6130do			
1700-1800	Canada, CKZU Vancouver	6160do			
1700-1800	China, China Radio Intl	9570af	11575af	15345af	
1700-1800	Costa Rica, R Peace Intl	7375am	7385am	21465am	
1700-1727	Czech Republic, R Prague	6055af	7345af	9490af	13600af
		15605af			
1700-1800	Ecuador, HCJB Quito	15270me	17790me	21455me	21480na
1700-1800	Egypt, Radio Cairo	15255af			
1700-1730	Georgia, Georgian Radio	11760eu			
1700-1800 as	Guam, KSDA AWR Agat	13720as			
1700-1800 vl	Italy, IRRS Milano	7125eu			
1700-1800	Japan, NHK/Radio Japan	9750na	11815as	11865na	17750me
1700-1730	Kazakhstan, R Alma Ata	15270eu			
1700-1800 s	Lebanon, King of Hope	6280me			
1700-1800 a	Morocco, RTV Marocaine	17815af			
1700-1800 mtwtf	New Zealand, R NZ Intl	9550pa			
1700-1750	North Korea, R Pyongyang	9325eu	9640af	9977af	13785af
1700-1800	Pakistan, Radio	11570eu	15550eu		
1700-1800 vl	PNG, Natl BC	4890do			
1700-1755	Poland, Polish R Warsaw	7270eu	9525eu		
1700-1800	Russia, Radio Moscow Intl	9505am	11960af	15180af	15385af
		15395af	15425na	17760am	
1700-1800 vl	Rwanda, Radiodiff Rwanda	9610do			
1700-1800	S Africa, Channel Africa	4945af			
1700-1800 vl	S Africa, Radio Oranje	4875do			
1700-1800	Saudi Arabia, BSKSA	9705eu	9720eu		
1700-1715 vl	Somalia, Radio Free Somal	7499do			
1700-1730	Sri Lanka, SLBC Colombo	6075as	9720as		
1700-1715	Swaziland, Trans World R	7120af			
1700-1730	Switzerland, Swiss R Intl	13635af	15430af	17635af	21770af
1700-1800 irreg	Tanzania, Radio	11765af			
1700-1800 vl	Uganda, Radio	4976do			
1700-1730	United Kingdom, BBC London	6005af	9515na	12095eu	15260na
		17860af	21660af		
1700-1800	United Kingdom, BBC London	3955eu	6180eu	6190af	6195eu
		7160me	9410eu	9630af	9740me
		15420af	17880af	21470af	15070af
1700-1800	USA, CSMonitor Boston MA	13625af			
1700-1800 sa	USA, CSMonitor Boston MA	13710na	17555na		
1700-1800	USA, KCBI Dallas TX	15375am			
1700-1800	USA, KTCN Salt Lk City UT	15590am			
1700-1800	USA, VOA Washington DC	6040eu	6110as	7125as	7215as
		9700as	9760eu	11920af	15205eu
		15255me	15395as	15445af	17895af
1700-1800	USA, WEWN Birmingham AL	13615na			
1700-1800	USA, WHRI Noblesville IN	9465na	13760am		
1700-1800	USA, WJCR Upton KY	7490na	13595na		
1700-1800 smtwf	USA, WMLK Bethel PA	9465eu			
1700-1800	USA, WRNO New Orleans LA		15420na		
1700-1800	USA, WWCR Nashville TN	13845am	15685am		
1700-1800	USA, WYFR Okeechobee FL	21500af			
1715-1730 mtwtf	Swaziland, Trans World R	7120af			
1730-1800	Netherlands, Radio	6020af	9605af	21515af	21590af
1730-1800	Romania, R Romania Intl	15340af	15365af	17745af	17805af
1730-1800 vl	Sierra Leone, SLBS	3316do			
1730-1800	Sweden, Radio	6065af	9655eu	15270af	
1730-1800	Vatican State, Vatican R	11625af	15090af	17730af	
1735-1745 th	Paraguay, Radio Nacional	6025sa	9735sa		
1745-1800 mtwtf	Honduras, R Copan Intl	15675am			
1745-1800	India, All India Radio	7412eu	9950me	11620eu	11860eu
		11935af	15080af		

1800-1900	Bahrain, Radio	6010do			
1800-1900	Brazil, Radiobras	15265eu			
1800-1900	Canada, CFCX Montreal	6005do			
1800-1900	Canada, CFRX Toronto	6070do			
1800-1900	Canada, CFVP Calgary	6030do			
1800-1900	Canada, CHNX Halifax	6130do			
1800-1900	Canada, CKZU Vancouver	6160do			
1800-1900	Costa Rica, R Peace Intl	7375am	7385am	21465am	
1800-1827	Czech Republic, R Prague	6055eu	7345eu	9490eu	13600me
		15605me	17535af		
1800-1900	Ecuador, HCJB Quito	21455am			
1800-1830	Egypt, Radio Cairo	15255af			
1800-1815	Ghana, GBC Radio 1	4915do			
1800-1815	Ghana, GBC Radio 2	3316do			
1800-1900 as	Guam, KSDA AWR Agat	13720as			
1800-1900 mtwtf	Honduras, R Copan Intl	15675am			
1800-1900	India, All India Radio	7412eu	9950me	11620eu	11860eu
		11935af	15080af		
1800-1815	Israel, Kol Israel	7465eu			
1800-1900 vl	Italy, IRRS Milano	7125eu			
1800-1900	Kuwait, Radio	13620na			
1800-1900	Lebanon, King of Hope	6280me			
1800-1900 mtwtf	New Zealand, R NZ Intl	9550pa			
1800-1830 s	Norway, Radio Norway Intl	9590eu	11860af		
1800-1900 vl	PNG, Natl BC	4890do			
1800-1830 mtwtf	Portugal, Radio	9780eu			
1800-1900	Russia, Radio Moscow Intl	9880eu	11685af	15290na	15385af
		15405as	15425as	17760af	17790na
1800-1900 vl	S Africa, Radio Oranje	4875do			
1800-1900	Saudi Arabia, BSKSA	9705eu	9720eu		
1800-1900 vl	Sierra Leone, SLBS	3316do			
1800-1900	Sudan, Radio Omdurman	7200do	9165do		
1800-1900	Swaziland, Trans World R	3200af	9500af		
1800-1900 irreg	Tanzania, Radio	11765af			
1800-1900 vl	Uganda, Radio	4976do			
1800-1900	United Kingdom, BBC London	3255af	3955eu	6005af	6180eu
		6190af	6195eu	7160me	9410eu
		11940af	15070af	15420af	9630af
				17880af	9740me
1800-1900	USA, CSMonitor Boston MA	9355pa	21640af		
1800-1900 sa	USA, CSMonitor Boston MA	17555na			
1800-1900	USA, KCBI Dallas TX	15375am			
1800-1900	USA, KJES Mesquite NM	9510na			
1800-1900	USA, KTCN Salt Lk City UT	15590am			
1800-1900	USA, VOA Washington DC	3980eu	6040eu	9700me	9760eu
		11920af	11995af	13710af	15205eu
		17895af	15580af	17800af	
1800-1900	USA, WEWN Birmingham AL	13615na	15695na		
1800-1900	USA, WHRI Noblesville IN	9590na	13760na		
1800-1900	USA, WINB Red Lion PA	15295eu			
1800-1900	USA, WJCR Upton KY	7490na	13595na		
1800-1900	USA, WMLK Bethel PA	9465eu			
1800-1900	USA, WRNO New Orleans LA		15420na		
1800-1900	USA, WWCR Nashville TN	13845am	15685am		
1800-1830	Vietnam, Voice of	9840eu	12020eu	15010eu	
1815-1900	Bangladesh, Radio	9570me	12030eu		
1830-1900	Bulgaria, Radio	7455	9700		
1830-1855	Finland, Radio	6120eu	9730eu	11755eu	15440eu
1830-1900	Netherlands, Radio	6020af	9605af	21515af	21590af
1830-1857	Slovakia, R Slovakia Intl	5915eu	7345eu	9605eu	
1830-1900	Sri Lanka, SLBC Colombo	9720eu	15120eu		
1830-1900	Switzerland, Swiss R Intl	6065eu	9655af	15270af	15505af
1840-1850 mtwtf	Greece, Voice of	15630af	15650af	17525af	
1845-1900	Armenia, Radio Yerevan	9450na	11920na	11960na	
1845-1900 irreg s	Mali, Radio Malienne	4783do	4835do	5995do	
1850-1900 as	New Zealand, R NZ Intl	9550pa			

## 1900 UTC [2:00 PM EST/11:00 AM PST]

1900-2000	Algeria, Radio Algiers	9535eu	15205eu	17745eu	
1900-2000	Argentina, RAE	15345eu			
1900-2000	Australia, Radio	5960as	5995pa	6060pa	6080as
		7240pa	7260as	11695pa	11720pa
1900-2000 vl	Australia, VL8A Alice Spg	2310do			
1900-2000 vl	Australia, VL8K Katherine	2485do			
1900-2000 vl	Australia, VL8T Tent Crk	2325do			
1900-1915	Azerbaijan, Radio	4958do	15240do		
1900-2000	Bahrain, Radio	6010do			
1900-1925	Belgium, R Vlaanderen Int	5910eu	13685af		
1900-2000	Bulgaria, Radio	7455	9700		
1900-2000	Canada, CFCX Montreal	6005do			

## 1800 UTC [1:00 PM EST/10:00 AM PST]

1800-1900	Australia, Radio	5960as	5995pa	6060pa	6080as
		7240pa	7260as	11695pa	11880pa
1800-1900 vl	Australia, VL8A Alice Spg	2310do			
1800-1900 vl	Australia, VL8T Tent Crk	2325do			



## 1900 UTC cont'd

1900-2000	Canada, CFRX Toronto	6070do			
1900-2000	Canada, CFVP Calgary	6030do			
1900-2000	Canada, CHNX Halifax	6130do			
1900-2000	Canada, CKZU Vancouver	6160do			
1900-2000	China, China Radio Intl	6955af	9440af		
1900-2000	Costa Rica, R Peace Intl	7375am	7385am	21465am	
1900-2000	Ecuador, HCJB Quito	17490va	17790eu	21455eu	21480eu
1900-1950	Germany, Deutsche Welle	9640af	11740af	11785af	11810af
		13790af	15350af	15390af	17765af
1900-1910 mtwhfa	Greece, Voice of	7450eu	9380eu		
1900-1945	India, All India Radio	7412eu	9950me	11620eu	11860eu
		11935af	15080af		
1900-2000 vl	Italy, IRRS Milano	7125va			
1900-2000	Japan, NHK/Radio Japan	9640am	9750as	11815pa	11865pa
		11875pa			
1900-2000	Kuwait, Radio	13620na			
1900-2000	Lebanon, King of Hope	6280me			
1900-2000	Liberia, Radio ELWA	4760do			
1900-2000 s	Morocco, RTV Marocaine	11920as			
1900-2000 mtwtf	New Zealand, R NZ Intl	9550pa			
1900-2000 as	New Zealand, R NZ Intl	9550pa			
1900-2000	Nigeria, Radio	3326do	4990do		
1900-2000	Nigeria, Voice of	7255af			
1900-2000 vl	PNG, Natl BC	4890do			
1900-2000 vl	PNG, Radio Central	3290do			
1900-2000 vl	PNG, Radio Milne Bay	3365do			
1900-2000 vl	PNG, Radio Western	3305do			
1900-1930 mtwhf	Portugal, Radio	15515af			
1900-2000	Romania, R Romania Intl	9750eu	11810eu	11940eu	15365eu
1900-2000	Russia, AWR Russia	9835eu			
1900-2000	Russia, Radio Moscow Intl	9640eu	9880af	11685eu	11760eu
		11995eu	15130af	15180af	15425na
		17560na	17690na	17710na	17760na
1900-2000	Saipan, KFBS Marpi	9465as			
1900-2000	Saudi Arabia, BSKSA	9705eu	9720eu		
1900-2000 vl	Sierra Leone, SLBS	3316do			
1900-2000	Spain, Spanish Natl Radio	15375af			
1900-2000	Sri Lanka, SLBC Colombo	9720eu	15120eu		
1900-2000	Swaziland, Trans World R	3200af	3240af		
1900-1915 irreg	Tanzania, Radio	11765af			
1900-2000 vl	Uganda, Radio	4976do			
1900-2000	United Kingdom, BBC London	3255af	3955eu	6005af	6180eu
		6190af	6195eu	7160me	9410eu
		15070af	17880af	9410eu	9630af
					9740me
1900-2000	USA, CSMonitor Boston MA	9355eu	13760na	15665eu	
1900-2000 sa	USA, CSMonitor Boston MA	17555na			
1900-2000	USA, KCBI Dallas TX	15375va			
1900-2000	USA, KTNB Salt Lk City UT	15590am			
1900-2000	USA, VOA Washington DC	3980eu	6040eu	7415af	9525pa
		9700me	9760eu	11870pa	11995af
		15180pa	15205eu	15580af	17895af
1900-2000	USA, WEWN Birmingham AL	13615na	15695na		
1900-2000	USA, WHRI Noblesville IN	9590na	13760na		
1900-2000	USA, WINB Red Lion PA	15295eu			
1900-2000	USA, WJCR Upton KY	7490na	13595na		
1900-2000	USA, WMLK Bethel PA	9465eu			
1900-2000	USA, WRNO New Orleans LA		15420na		
1900-2000	USA, WWCN Nashville TN	13845am	15610am	15685am	
1900-2000	USA, WYFR Okeechobee FL	15355af	21615af		
1900-1930	Vietnam, Voice of	9840eu	12020eu	15010eu	
1910-1920	Botswana, Radio	3356af	4830af	7255af	
1930-2000	Austria, R Austria Intl	5945eu	6155eu	13730af	
1930-2000	Georgia, Georgian Radio	9565me			
1930-2000	Iran, VOIRI Tehran	9022eu	15260eu		
1930-2000	Netherlands, Radio	17605af	21590af		
1930-2000	Poland, Polish R Warsaw	6135eu	7270eu	7285eu	9525eu
1930-1957	Slovakia, R Slovakia Intl	5915eu	7345eu	9605eu	
1940-2000 mha	Mongolia, R Ulaanbaatar	11790eu	11850eu		
1950-2000	Vatican State, Vatican R	5885eu	7250eu		
2000-2100 vl	Australia, Radio	5960as	6060pa	6080as	7240pa
		7260as	9580pa	11695pa	11720pa
2000-2100 vl	Australia, VL8A Alice Spg	2310do			
2000-2100 vl	Australia, VL8K Katherine	2485do			
2000-2100 vl	Australia, VL8T Tent Crk	2325do			
2000-2100	Bahrain, Radio	6010do			
2000-2100	Canada, CFCX Montreal	6005do			
2000-2100	Canada, CFRX Toronto	6070do			
2000-2100	Canada, CFVP Calgary	6030do			
2000-2100	Canada, CHNX Halifax	6130do			
2000-2100	Canada, CKZU Vancouver	6160do			
2000-2100	China, China Radio Intl	9920eu	11500eu	11715af	15110af
2000-2100	Costa Rica, R Peace Intl	7375am	7385am	21465am	
2000-2027	Czech Republic, R Prague	6055eu	7300eu	7345eu	9490eu
2000-2100	Ecuador, HCJB Quito	21455am			
2000-2030	Ghana, GBC Radio 1	4915do			
2000-2030	Ghana, GBC Radio 2	3366do			
2000-2100	Indonesia, Voice of	9675me	11752eu		
2000-2030	Iran, VOIRI Tehran	9022eu	15260eu		
2000-2030	Israel, Kol Israel	7465eu	9435eu	11588na	11603na
		11675na	17575na		
2000-2100 vl	Italy, IRRS Milano	7125va			
2000-2010 mtwhf	Kenya, Kenya BC Corp	4935do			
2000-2100	Kuwait, Radio	13620na			
2000-2100	Lebanon, King of Hope	6280me			
2000-2100	Liberia, Radio ELWA	4760do			
2000-2030	Lithuania, Radio Vilnius	9710na			
2000-2010 smwha	Mongolia, R Ulaanbaatar	11790eu	11850eu		
2000-2100	New Zealand, R NZ Intl	9550pa			
2000-2100	Nigeria, Radio	3326do	4990do		
2000-2100	Nigeria, Voice of	7255af			
2000-2100	North Korea, R Pyongyang	6576eu	9345eu	9640af	9977af
2000-2030 s	Norway, Radio Norway Intl	9590eu			
2000-2100 vl	PNG, Natl BC	4890do			
2000-2100 vl	PNG, Radio Central	3290do			
2000-2100 vl	PNG, Radio Enga	2410do			
2000-2100 vl	PNG, Radio Milne Bay	3365do			
2000-2100 vl	PNG, Radio Western	3305do			
2000-2100	Russia, Radio Moscow Intl	7205eu	7300eu	7335eu	7400eu
		9640eu	9815eu	9880eu	11550af
		11685af	11730na	11760na	11805af
		13775af	15340as	15385af	17605na
2000-2100 vl	S Africa, Radio Oranje	4875do			
2000-2100	Saudi Arabia, BSKSA	9705eu	9720eu		
2000-2100 vl	Sierra Leone, SLBS	3316do			
2000-2100 vl	Solomon Islands, SIBC	5020do	9545do		
2000-2045	Swaziland, Trans World R	3200af	3240af		
2000-2030	Switzerland, Swiss R Intl	9885af	12035af	13635af	15505af
2000-2100 vl	Uganda, Radio	4976do			
2000-2030	United Kingdom, BBC London	6190af	6195eu	7160me	9630af
			9740me	15070af	17880af
2000-2100	United Kingdom, BBC London	3255af	3955eu	5975am	6005af
		6180eu	7325eu	9410eu	15260sa
2000-2100	USA, CSMonitor Boston MA	13770af	15665eu		
2000-2100	USA, KCBI Dallas TX	15375am			
2000-2100	USA, KTNB Salt Lk City UT	15590am			
2000-2030	USA, VOA Washington DC	11785af	15160af		
2000-2100	USA, VOA Washington DC	6040eu	7415af	9700me	9760eu
		13710af	15205eu	15580af	17895af
2000-2100	USA, WEWN Birmingham AL	13615na			
2000-2100	USA, WHRI Noblesville IN	13760af			
2000-2100	USA, WJCR Upton KY	7490na	13595na		
2000-2100	USA, WMLK Bethel PA	9465eu			
2000-2100	USA, WRNO New Orleans LA		15420na		
2000-2100	USA, WWCN Nashville TN	13845am	15685am		
2000-2100	USA, WYFR Okeechobee FL	7355eu	15566eu	17750af	21525af
2000-2030	Vatican State, Vatican R	9645af	11625af	15090af	
2005-2100	Syria, Radio Damascus	12085na	15095na		
2010-2100 sa	Kenya, Kenya BC Corp	4935do			
2015-2045 s	Swaziland, Trans World R	3200af			
2025-2045	Italy, RAI Rome	7235me	9575me	11800me	
2030-2035	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
2030-2100	Egypt, Radio Cairo	15375af			
2030-2035 vl	Latvia, R Latvia Intl	5935eu			
2030-2100 mtwhfa	Palau, KHBN Voice of Hope	11980as			
2030-2057	Slovakia, R Slovakia Intl	7345eu			
2030-2100	South Korea, Radio Korea	5975eu	6035af	9640me	9870eu
2030-2100	Sweden, Radio	6065af	9695eu		
2030-2100	Vietnam, Voice of	9840eu	12020eu	15010eu	
2045-2100	India, All India Radio	7412eu	9910au	9950eu	11620eu
		11715pa	15265pa		

## 2000 UTC [3:00 PM EST/12:00 PM PST]

2000-2100	Australia, Radio	5960as	6060pa	6080as	7240pa
		7260as	9580pa	11695pa	11720pa
2000-2100 vl	Australia, VL8A Alice Spg	2310do			
2000-2100 vl	Australia, VL8K Katherine	2485do			



## 2100 UTC

[4:00 PM EST/1:00 PM PST]

2100-2200	Australia, Radio	9645as	11720pa	11855as	
2100-2106	Bahrain, Radio	6010do			
2100-2200	Bulgaria, Radio	6085	9700		
2100-2200	Canada, CFCX Montreal	6005do			
2100-2200	Canada, CFRX Toronto	6070do			
2100-2200	Canada, CFVP Calgary	6030do			
2100-2200	Canada, CHNX Halifax	6130do			
2100-2200	Canada, CKZU Vancouver	6160do			
2100-2200	China, China Radio Intl	9920eu	9920eu	11500eu	11715af
		15110af			
2100-2130	China, China Radio Intl	11715af	15110af		
2100-2200	Costa Rica, R Peace Intl	7375am	7385am	21465am	
2100-2130	Czech Republic, R Prague	6055eu	7300eu	7345eu	9490eu
2100-2130	Ecuador, HCJB Quito	21455am			
2100-2200	Egypt, Radio Cairo	15375af			
2100-2150	Germany, Deutsche Welle	9640af	9670as	9765as	11785as
		13690as	15135af	15350af	15360as
2100-2200 mtwhfa	Honduras, R Copan Intl	15675am			
2100-2200	India, All India Radio	7412eu	9910au	9950eu	11620eu
		11715pa	15265pa		
2100-2200 vl	Iraq, Radio Iraq Intl	11810na			
2100-2130 vl	Italy, IRRS Milano	7125af			
2100-2200	Japan, NHK/Radio Japan	6035eu	9640eu	9750eu	11815au
		11925eu	15430af		
2100-2200	Lebanon, King of Hope	6280me			
2100-2200 mtwtf	Lebanon, Wings of Hope	11530me			
2100-2200	Liberia, Radio ELWA	4760do			
2100-2137	New Zealand, R NZ Intl	9550pa			
2100-2200	Nigeria, Radio	3326do	4990do		
2100-2200 mtwhfa	Palau, KHBV Voice of Hope	11980as			
2100-2200 vl	PNG, Natl BC	4890do			
2100-2200 vl	PNG, Radio Central	3290do			
2100-2200 vl	PNG, Radio Enga	2410do			
2100-2200 vl	PNG, Radio Milne Bay	3365do			
2100-2200 vl	PNG, Radio Western	3305do			
2100-2130 mtwhf	Portugal, Radio	15250af			
2100-2200	Romania, R Romania Intl	7195eu	7225eu	9750eu	11940eu
2100-2200	Russia, Radio Galaxy	11880eu			
2100-2200	Russia, Radio Moscow Intl	6130eu	7230eu	7300eu	7335eu
		7400eu	9640na	9815na	9820na
		11685na	11710na	11730na	11760af
		11905af	12015af	13775na	15340na
		17690af	17720as	15385af	17605af
2100-2200 vl	S Africa, Radio Oranje	4875do			
2100-2200 vl	Sierra Leone, SLBS	3316do			
2100-2200 vl	Solomon Islands, SIBC	5020do	9545do		
2100-2130	South Korea, Radio Korea	6480af	7550me	15575eu	
2100-2200	Spain, Spanish Natl Radio	6125eu			
2100-2200	Sri Lanka, SLBC Colombo	15120as			
2100-2105	Syria, Radio Damascus	12085na	15095na		
2100-2200	Turkey, Voice of	9445eu	11895		
2100-2200	Ukraine, R Ukraine Intl	6090eu	7150eu	7195eu	7240eu
		9685eu	11950eu		
2100-2200	United Kingdom, BBC London	3255af	3955eu	5975am	6005af
		6180eu	6195eu	7325eu	9410eu
2100-2200	USA, CSMonitor Boston MA	9465na	13770eu	17555sa	
2100-2200	USA, KCBI Dallas TX	15725am			
2100-2200	USA, KTNB Salt Lk City UT	15590na			
2100-2200	USA, VOA Washington DC	6040eu	7415af	9700me	9760eu
		11870pa	13710af	15185as	15205eu
		17800af	17895af	21485af	
2100-2200	USA, WEWN Birmingham AL	13615na			
2100-2200	USA, WINB Red Lion PA	15185eu			
2100-2200	USA, WJCR Upton KY	7490na	13595na		
2100-2200	USA, WMLK Bethel PA	9465eu			
2100-2200	USA, WRNO New Orleans LA		15420na		
2100-2200	USA, WWCR Nashville TN	13845am	15610am	15685am	
2100-2200	USA, WYFR Okeechobee FL	7355eu	15566eu	17750af	21525af
2100-2110	Vatican State, Vatican R	5885eu	7250eu		
2103-2110	Croatia, Croatian Radio	9830eu	13830eu		
2110-2200	Syria, Radio Damascus	12085na	15095na		
2115-2200	Egypt, Radio Cairo	9900eu			
2115-2130 mtwhf	United Kingdom, BBC Carib	6110am	15390am	17715am	
2130-2200	Australia, Radio	15240pa	15320as	15365pa	17795pa
		21740pa			
2130-2200 vl	Australia, VL8A Alice Spg	4835do			
2130-2200 vl	Australia, VL8K Katherine	5025do			
2130-2200 vl	Australia, VL8T Tent Crk	4910do			
2130-2200	Canada, RCI Montreal	5995eu	7260eu	11945eu	13650eu
		13670af	15140af	15325af	17820af
2130-2200	Ecuador, HCJB Quito	17490va	17790eu	21455va	21480eu
2130-2200	Finland, Radio	6120eu	11755eu	15440eu	
2130-2200	Sweden, Radio	6065eu			
2138-2200	New Zealand, R NZ Intl	15120pa			
2140-2200 s	Eqt Guinea, Radio Africa	7190af			

2145-2200

Armenia, Radio Yerevan

9450na

11920na

11960na

2145-2200

Bulgaria, Radio

11720eu

15330na

2145-2200

South Korea, Radio Korea

6480eu

15575eu

## 2200 UTC

[5:00 PM EST/2:00 PM PST]

2200-2212	Albania, R Tirana Intl	9760na	11825na		
2200-2300	Australia, Radio	9645as	11720pa	11855as	15240pa
		15320as	15365pa	17795pa	21740pa
2200-2225	Belgium, R Vlaanderen Int	5910eu			
2200-2300	Canada, CFCX Montreal	6005do			
2200-2300	Canada, CFRX Toronto	6070do			
2200-2300	Canada, CFVP Calgary	6030do			
2200-2300	Canada, CHNX Halifax	6130do			
2200-2300	Canada, CKZU Vancouver	6160do			
2200-2230 as	Canada, RCI Montreal	11705as			
2200-2230	Canada, RCI Montreal	5995eu	7260eu	11945eu	13650eu
		13670af	15140af	15325af	17870af
2200-2300	China, China Radio Intl	1193	9880eu		
2200-2230	China, China Radio Intl	3985eu			
2200-2220 s	Congo, R Natl Congolaise	4765do	5985do		
2200-2300	Costa Rica, R Peace Intl	7375am	7385am	21465am	
2200-2230	Czech Republic, R Prague	6055eu	7300eu	9605eu	
2200-2245	Egypt, Radio Cairo	9900eu			
2200-2258 s	Eqt Guinea, Radio Africa	7190af			
2200-2245	Finland, Radio	9730eu	11740eu	11810eu	
2200-2230 mtwhfa	Honduras, R Copan Intl	15675am			
2200-2230	India, All India Radio	7412eu	9910au	9950eu	11620eu
		11715pa	15265eu		
2200-2300 vl	Iraq, Radio Iraq Intl	11810am	15180am	17940am	
2200-2300 vl	Italy, IRRS Milano	7125va			
2200-2225	Italy, RAI Rome	9710as	11800as	15330as	
2200-2300	Lebanon, King of Hope	6280me			
2200-2300 mtwtf	Lebanon, Wings of Hope	11530me			
2200-2300	Liberia, Radio ELWA	4760do			
2200-2300 vl	Malaysia, RTM Kota Kinab	5980do			
2200-2300 smtwha	Malaysia, RTM Radio 4	7295do			
2200-2300 vl	Malaysia, RTM Sarawak	4950do			
2200-2300	New Zealand, R NZ Intl	15120pa			
2200-2300	Nigeria, Radio	3326do	4990do		
2200-2300 mtwhfa	Palau, KHBV Voice of Hope	11980as			
2200-2300 vl	PNG, Natl BC	4890do			
2200-2300	Russia, Radio Moscow Intl	7305eu	7335eu	9480af	9750eu
		9815eu	9820eu	11550na	11685af
		11835af	11905af	11950af	12015na
2200-2300 vl	S Africa, Radio Oranje	4875do			
2200-2300 vl	Sierra Leone, SLBS	3316do			
2200-2300	Singapore, SBC Radio One	5010do	5052do	11940do	
2200-2300 vl	Solomon Islands, SIBC	5020do	9545do		
2200-2230	South Korea, Radio Korea	7275as	9640as		
2200-2245	South Korea, Radio Korea	6480eu	15575eu		
2200-2230	Switzerland, Swiss R Intl	9810am	9885am	12035am	15570am
2200-2210	Syria, Radio Damascus	12085na	15095na		
2200-2300	Taiwan, VO Free China	17750eu	21720eu		
2200-2300	UAE, Radio Abu Dhabi	11885na	15305na	15315na	
2200-2300	Ukraine, R Ukraine Intl	4795eu	6020eu	7195eu	7240eu
		9710eu	9860eu		
2200-2300	United Kingdom, BBC London	3955eu	5975am	6195eu	7325eu
		9410eu	9590na	11750sa	15260sa
2200-2300	USA, CSMonitor Boston MA	13625as	13770as	15405as	
2200-2300	USA, KCBI Dallas TX	15725am			
2200-2300	USA, KTNB Salt Lk City UT	15590am			
2200-2300	USA, VOA Washington DC	7215as	9770as	11760as	15185as
		15290as	15305as	17735as	17820as
2200-2300	USA, WEWN Birmingham AL	7425am			
2200-2300	USA, WHRI Noblesville IN	13760eu			
2200-2245	USA, WINB Red Lion PA	15185eu			
2200-2300	USA, WJCR Upton KY	7490na	13595na		
2200-2300	USA, WRNO New Orleans LA		15420na		
2200-2300	USA, WWCR Nashville TN	13845am	15610am		
2200-2300	USA, WYFR Okeechobee FL	17750eu	21525af		
2200-2230 s	USA, KGEI San Francisco CA	15280sa			
2203-2209	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
2230-2300	Israel, Kol Israel	7465eu	9435eu	11587na	11603na
		11675na	15640na	15650na	17575na
2230-2300	Libya, Radio Jamahiriya	7245eu			
2230-2300	Lithuania, Radio Vilnius	9710na			
2230-2300	Sweden, Radio	6065as	11910eu		
2240-2300	Armenia, Radio Yerevan	11920na	11945na	15385na	
2240-2250 smtwhf	Greece, Voice of	11645au			
2245-2300	Bulgaria, Radio	7455eu	9700na		
2245-2300	Ghana, GBC Radio 1	4915do			
2245-2300	Ghana, GBC Radio 2	3366do			
2245-2300	India, All India Radio	9910as	11745as	11785as	15110as
		15145as			
2245-2300	USA, WINB Red Lion PA	15145eu			
2245-2300	Vatican State, Vatican R	9600as	11830as	15090pa	



## 2300 UTC

[6:00 PM EST/3:00 PM PST]

## FREQUENCIES

2300-2400	Australia, Radio	11720pa	11855as	15240pa	15320as
		15365pa	17795pa	21740pa	
2300-2400 vl	Australia, VL8A Alice Spg	4835do			
2300-2400 vl	Australia, VL8K Katherine	5025do			
2300-2400 vl	Australia, VL8T Tent Crk	4910do			
2300-2400	Bulgaria, Radio	7455eu	9700na		
2300-2400	Canada, CFCX Montreal	6005do			
2300-2400	Canada, CFRX Toronto	6070do			
2300-2400	Canada, CFVP Calgary	6030do			
2300-2400	Canada, CHNX Halifax	6130do			
2300-2400	Canada, CKZU Vancouver	6160do			
2300-2330 mtwtf	Canada, RCI Montreal	5995eu	7250eu		
2300-2400 as	Canada, RCI Montreal	5960na	5995eu	7250eu	9755na
		11845na			
2300-2400	Costa Rica, AWR Alajuela	5030ca	9725ca	11870ca	
2300-2400	Costa Rica, R Peace Intl	7375am	7385am	21465am	
2300-2400	Ecuador, HCJB Quito	21455am			
2300-2315 a	Eqt Guinea, Radio Africa	7203af			
2300-2400	Guam, KSDA AWR Agat	15610as			
2300-2400	India, All India Radio	9910as	11745as	11785as	15110as
		15145as			
2300-2400 vl	Iraq, Radio Iraq Intl	15180am			
2300-2400	Japan, NHK/Radio Japan	6060eu	6125eu	7140eu	15430as
		17810as			
2300-2400	Lebanon, King of Hope	6280me			
2300-2400 mtwhf	Lebanon, Wings of Hope	11530me			
2300-2400	Libya, Radio Jamahiriya	7245eu			
2300-2400 vl	Malaysia, RTM Kota Kinaba	5980do			
2300-2400 smtwha	Malaysia, RTM Radio 4	7295do			
2300-2400 vl	Malaysia, RTM Sarawak	4950do	7160do		
2300-2400	New Zealand, R NZ Intl	15120pa			
2300-2350	North Korea, R Pyongyang	11700am	13650am		
2300-2330 s	Norway, Radio Norway Intl	6120na			
2300-2400 mtwhfa	Palau, KHBN Voice of Hope	11980as			

2300-2400 vl	PNG, Natl BC	4890do			
2300-2400	Russia, Radio Moscow Intl	7305eu	7335eu	9750na	9815eu
		9860na	11835na	12015na	12050na
		13775na	15425na	15470as	17570as
		17675as			
2300-2400 vl	S Africa, Radio Oranje	4875do			
2300-2310 vl	Sierra Leone, SLBS	3316do			
2300-2400	Singapore, SBC Radio One	5010do	5052do	11940do	
2300-2400 vl	Solomon Islands, SIBC	5020do	9545do		
2300-2400	Turkey, Voice of	7185me	9445na	11895eu	
2300-2400	UAE, Radio Abu Dhabi	11855na	15305na	15315na	
2300-2400	United Kingdom, BBC London	3955eu	5975na	6195na	7180eu
		7325na	9410eu	9590na	9915am
		11750sa	15260sa		
2300-2400	USA, CSMonitor Boston MA	9465na	13625as	13770as	17555sa
2300-2400	USA, KCBI Dallas TX	15725am			
2300-2400	USA, KTNB Salt Lk City UT	15590na			
2300-2400	USA, VOA Washington DC	7215as	9770as	11760as	15185as
		15290as	15305as	17735as	17820as
2300-2400	USA, WEWN Birmingham AL	7425am			
2300-2400	USA, WHRI Noblesville IN	13760am			
2300-2400	USA, WINB Red Lion PA	15145eu			
2300-2400	USA, WJCR Upton KY	7490na	13595na		
2300-2400	USA, WRNO New Orleans LA		7355na		
2300-2400	USA, WWCR Nashville TN	13845am	15610am	15685am	
2300-2315	Vatican State, Vatican R	9600as	11830as	15090pa	
2330-2400	Austria, R Austria Intl	9870sa	13730sa		
2330-2400 a	Colombia, Radio Nacional	11822.5	17865am		
2330-2400	Netherlands, Radio	6020na	6165na		
2330-2400 m	Sri Lanka, SLBC Colombo	15425am			
2330-2400	Thailand, Radio	4830eu	9655as	11905as	
2330-2400	Vietnam, Voice of	9840as	12020as	15010as	
2335-2345 smtwhf	Greece, Voice of	9425sa	11595sa	11645sa	

## SELECTED PROGRAMS

## Sundays

- 2300 Radio Australia: Network Asia (Part 2). NEW! The second half of this program of news, interviews, current affairs, and developments in the Asian/Pacific region.
- 2300 Radio Bulgaria: Sports and Tourism. Sports news, village tours and sports-related products.
- 2305 BBC: World Business Review. A look back at the previous week's business and a preview of upcoming events.
- 2310 Radio Australia: Sports Report. See S 1310.
- 2310 VOA (as): VOA Monday Morning. See S 0010.
- 2315 BBC: Ray on Record. Robin Ray presents some of the best in classical music.
- 2315 Radio Bulgaria: Answering Your Letters. Replies to listener letters.
- 2341 Radio Bulgaria: Radio Bulgaria Calling. DX Program for radio amateurs and shortwave listeners.
- 2356 Radio Bulgaria: Timeout for Music. The latest hits of Bulgarian musicians.

## Mondays

- 2300 Radio Australia: Network Asia (Part 2). See S 2300.
- 2300 Radio Bulgaria: Review of Current Affairs. See S 0415.
- 2305 BBC: World Business Report. Latest news from the markets in the Far East, Europe and the USA.
- 2310 Radio Australia: Sports Report. See S 1310.
- 2310 VOA (as): Newline. See M 0010.
- 2315 Radio Bulgaria: Business and Finance. Economic news briefs and financial developments in Bulgaria.
- 2330 BBC: Multitrack 1: Top 20. World Service Top 20.
- 2330 Radio Bulgaria: Sports Roundup. News about seasonal sporting events.
- 2330 VOA (as): VOA Tuesday Morning. See S 0010.
- 2345 Radio Bulgaria: History Club. True stories about the Ottoman Empire period.

## Tuesdays

- 2300 Radio Australia: Network Asia (Part 2). See S 2300.
- 2303 Radio Bulgaria: Review of Current Affairs. See S 0415.
- 2305 BBC: World Business Report. See M 2305.
- 2310 Radio Australia: Sports Report. See S 1310.
- 2310 VOA (as): Newline. See M 0010.
- 2315 BBC: Concert Hall. See S 1515.
- 2330 VOA (as): VOA Wednesday Morning. See S 0010.
- 2341 Radio Bulgaria: Mosaical Facts about Bulgaria. A panorama of Bulgaria and its people.

## Wednesdays

- 2300 Radio Australia: Network Asia (Part 2). See S 2300.
- 2300 Radio Bulgaria: Review of Current Affairs. See S 0415.
- 2305 BBC: World Business Report. See M 2305.
- 2310 Radio Australia: Sports Report. See S 1310.
- 2310 VOA (as): Newline. See M 0010.
- 2315 BBC: From Our Own Correspondent. See S 0330.
- 2315 Radio Bulgaria: From School to Campus. See S 0130.
- 2330 BBC: Multitrack 2. New pop records, interviews, news and competitions.
- 2330 Radio Bulgaria: Economy and Farming. The effects of agriculture on the Bulgarian economy.
- 2330 VOA (as): VOA Thursday Morning. See S 0010.
- 2345 Radio Bulgaria: Folk Studio. The story of folk music in Bulgaria.
- 2345 Radio Bulgaria: Science/Technology/Ecology. A look at developments in these activities.

## Thursdays

- 2300 Radio Australia: Network Asia (Part 2). See S 2300.
- 2300 Radio Bulgaria: Review of Current Affairs. See S 0415.
- 2305 BBC: World Business Report. See M 2305.
- 2310 Radio Australia: Sports Report. See S 1310.

- 2310 VOA (as): Newline. See M 0010.
- 2315 BBC: Music Review. News and views from the world of music.
- 2315 Radio Bulgaria: Lifestyle. See S 0115.
- 2330 VOA (as): VOA Friday Morning. See S 0010.
- 2345 Radio Bulgaria: Across the Map of Bulgaria. See M 0115.

## Fridays

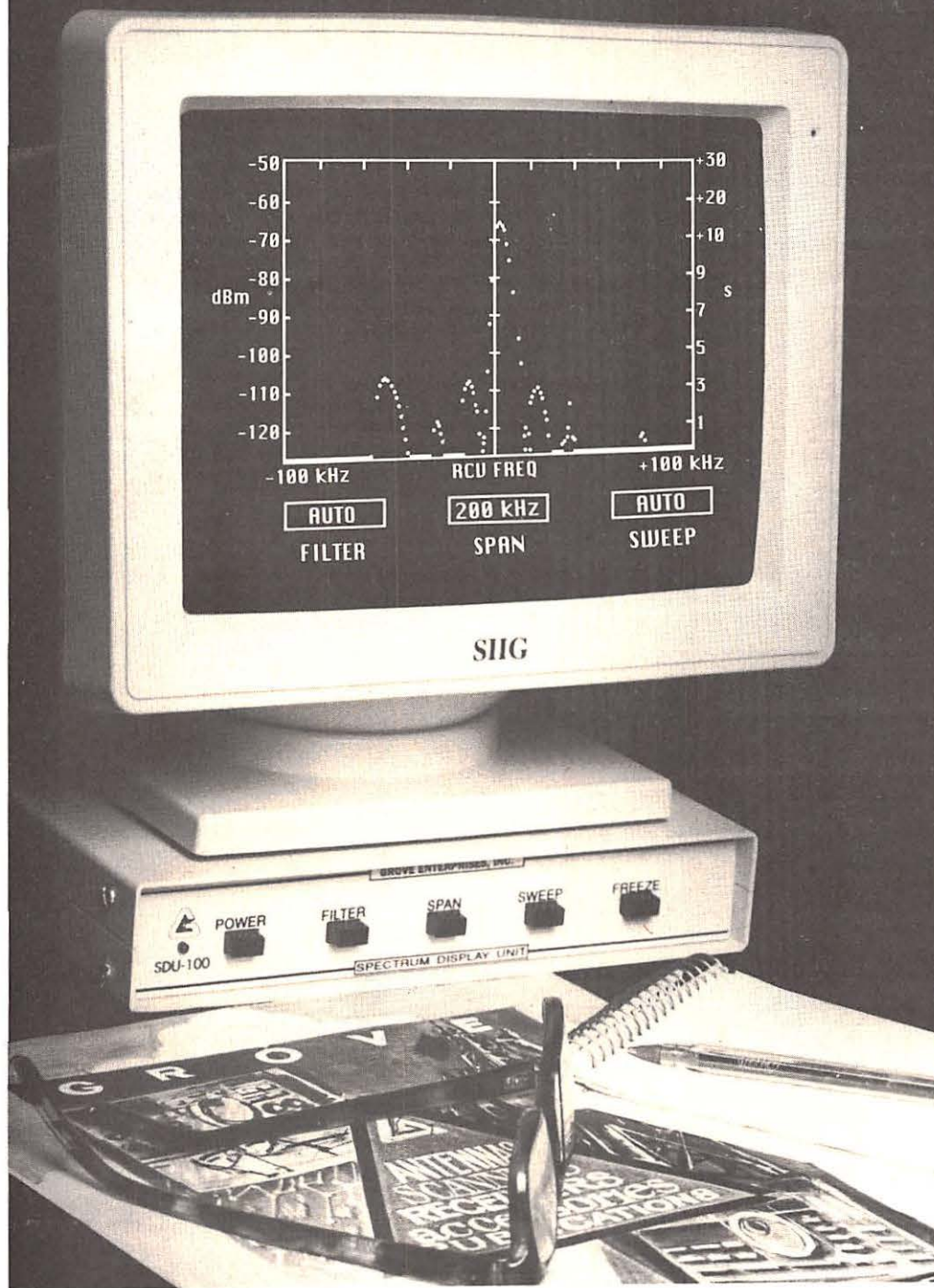
- 2300 Radio Australia: Network Asia (Part 2). See S 2300.
- 2300 Radio Bulgaria: Review of Current Affairs. See S 0415.
- 2305 BBC: World Business Report. See M 2305.
- 2310 Radio Australia: Business Weekly. Business and finance developments in the Asia/Pacific region.
- 2310 VOA (as): Newline. See M 0010.
- 2315 Radio Bulgaria: Sports and Tourism. See S 2300.
- 2330 BBC: Multitrack 3. Latest developments on the British music scene.
- 2330 Radio Australia: Blacktracker. See W 1330.
- 2330 Radio Bulgaria: Timeout for Music. See S 2356.
- 2330 VOA (as): VOA Saturday Morning. See S 0010.
- 2345 Radio Bulgaria: Weekly Spotlight. See M 0430.

## Saturdays

- 2300 Radio Bulgaria: Women's Magazine. See F 0145.
- 2305 BBC: Words of Faith. See M 1209.
- 2310 BBC: Book Choice. See W 0425.
- 2310 Radio Australia: Asia Focus. See M 1510.
- 2310 VOA (as): VOA Sunday Morning. See S 0010.
- 2315 BBC: A Jolly Good Show. See T 1515.
- 2315 Radio Bulgaria: Cultural Review. A review of cultural events in Bulgaria and cultural newstips.
- 2330 Radio Australia: At Your Request. See S 0330.
- 2341 Radio Bulgaria: Folk Studio. See W 2345.



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The SDU-100 attaches to the IF output jack on the back of your receiver, and it shows you all the signals in a slice of the radio spectrum you select — from 100 kHz up to 10 megahertz wide. Each signal appears as a "spike" on the display (the higher the spike, the stronger the signal).

Just the way surveillance countermeasures teams do, you'll be able to use both your ears and eyes in hunting new signals. With the power of spectrum display technology, you'll be able to track down elusive signals faster and more efficiently.

While you can listen to only one signal at a time, the SDU-100 can show you a whole band of signals at once. So, if you are listening to a particular transmission and suddenly a new spike appears on the monitor, you'll know immediately that there's a new signal to be checked out. Without the power of the SDU-100, those momentary transmissions would go undetected.

The Grove SDU-100 Spectrum Display Unit, and a nine-inch video monitor — the same spectrum surveillance technology that the pros use — costs just \$599.95. For a limited time, you can purchase the SDU-100 in combination with a compatible receiver from Grove, and you'll save \$50!

The Grove SDU-100 Spectrum Display Unit is now available for:

- ICOM R7000, R7100, R9000
- Yaesu FT1000, FRG-100
- Kenwood R5000\*
- Drake R8, TR-7\*
- JRC NRD-535-D\*
- Uniden BC890XLT\*
- Mason A2\*

If you're serious about communications monitoring, the SDU-100 will put your signal hunting in overdrive!



Grove Enterprises, Inc.  
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Brasstown, NC 28902-0098

\* Requires receiver modification, available from the Grove service department.



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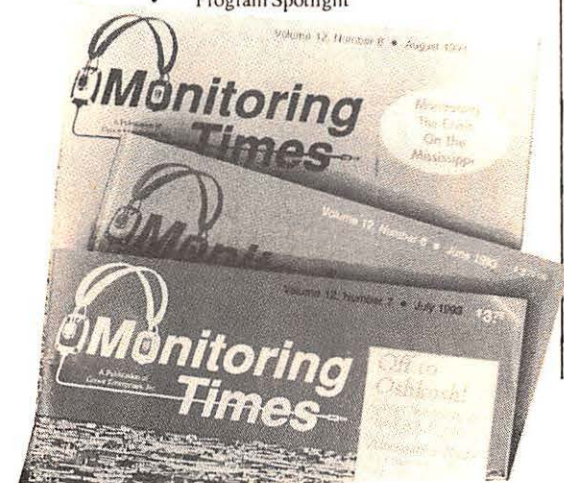
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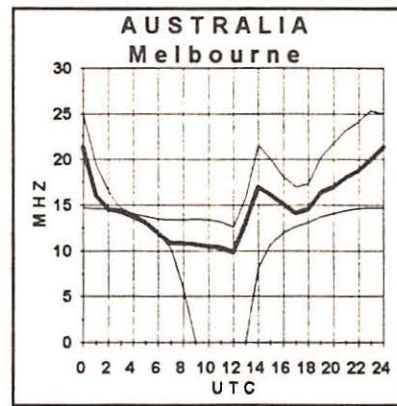
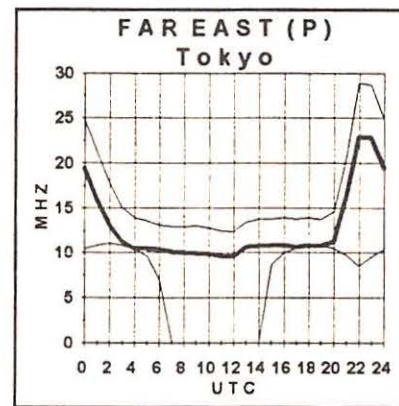
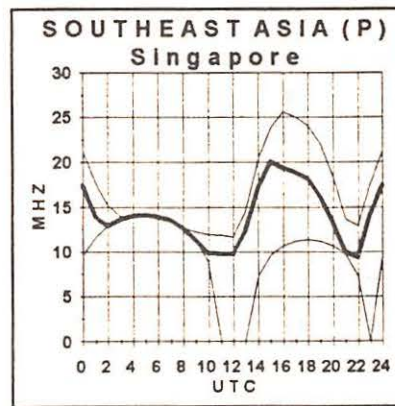
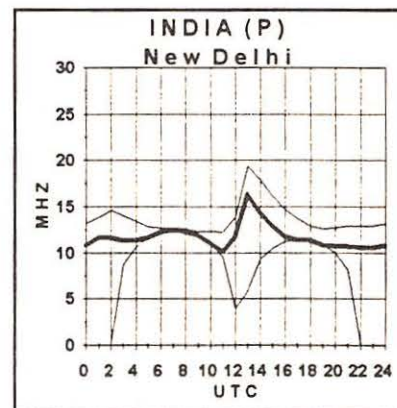
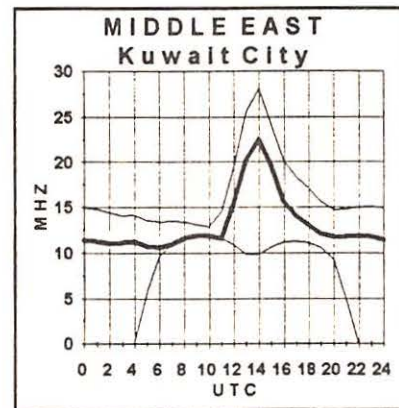
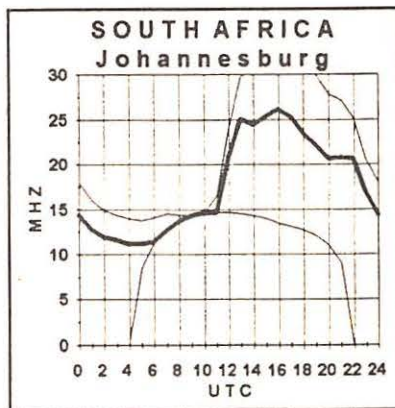
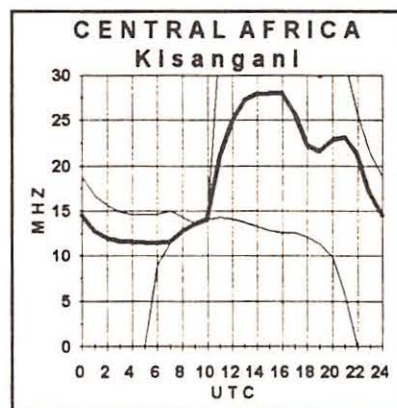
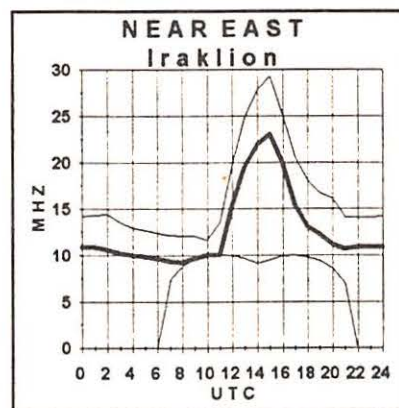
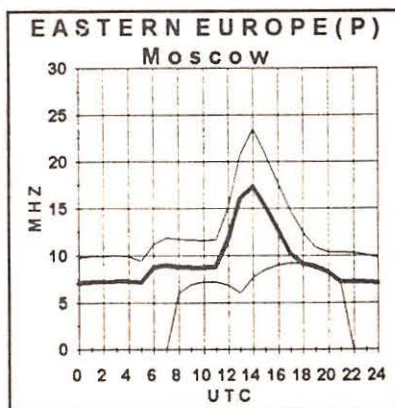
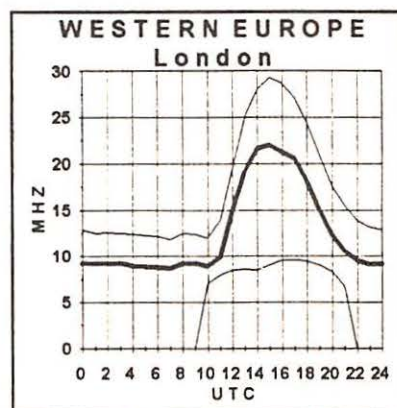
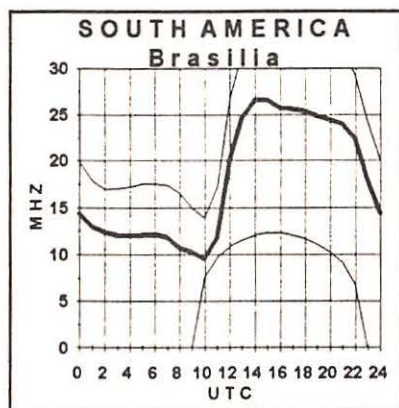
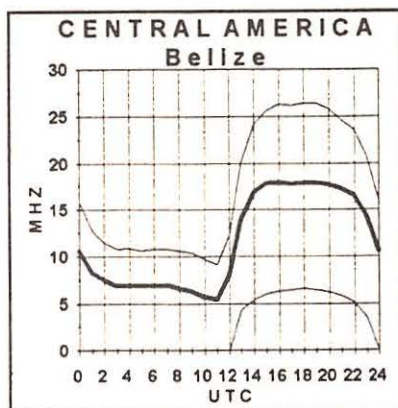




# Propagation conditions: Eastern United States

**How to use the propagation charts:** Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location. Then look for the one most closely describing the geographic location of the station you want to hear.

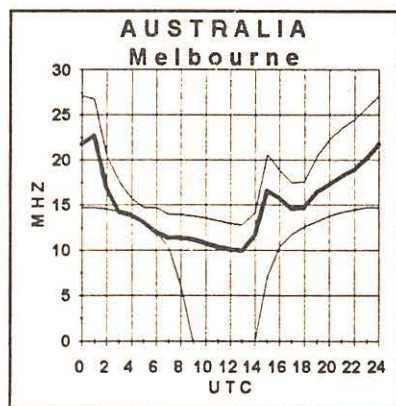
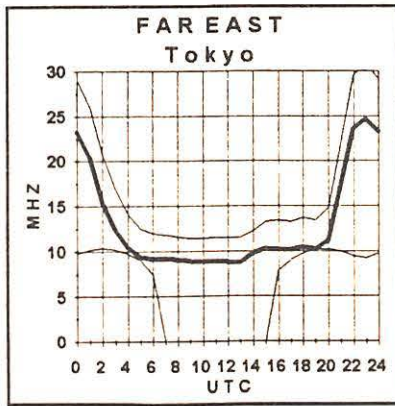
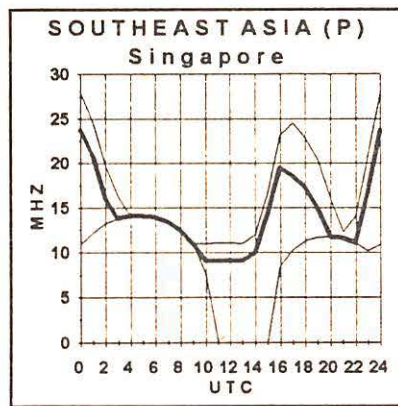
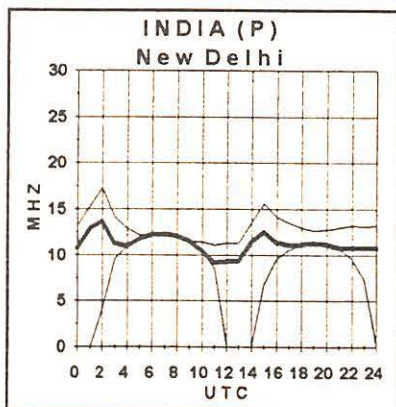
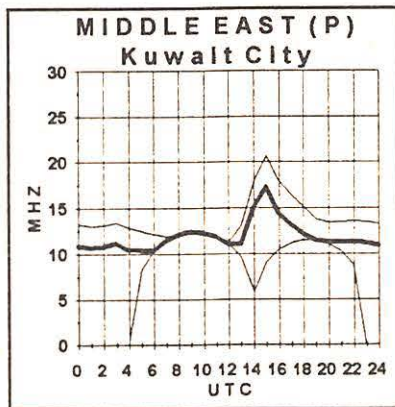
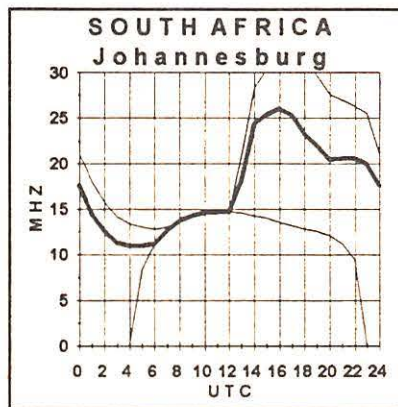
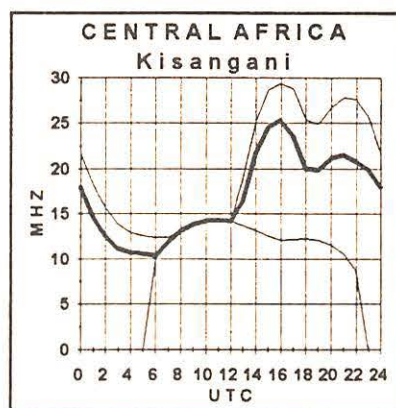
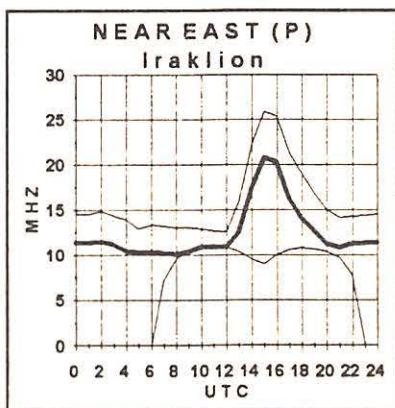
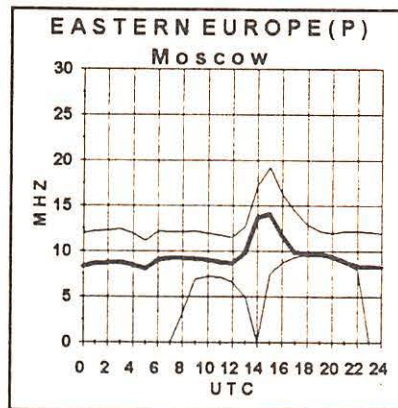
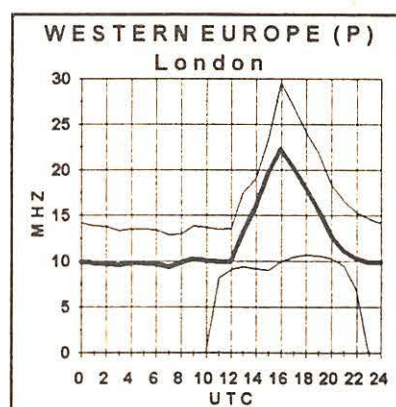
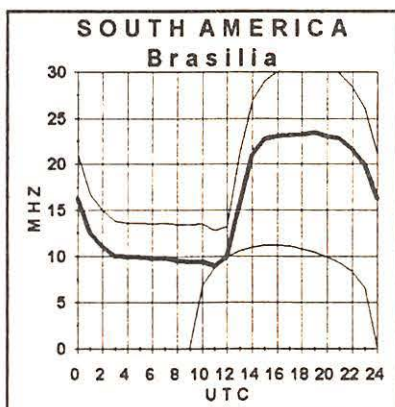
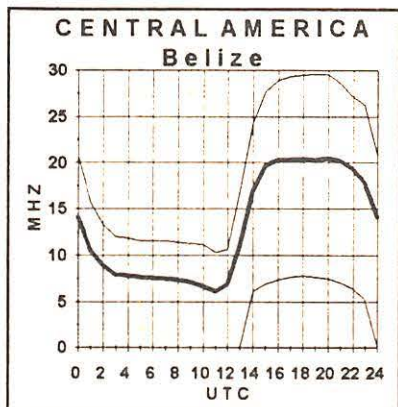
Once you've located the correct charts, look along the horizontal axis of the graph for the time you are listening. The top line of the graph shows





# Propagation Conditions: Western United States

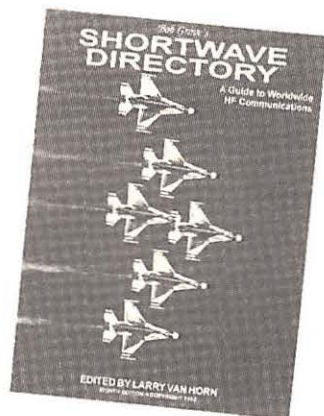
the maximum usable frequency (MUF), the heavy middle line is the frequency for best reception, or optimum working frequency (OWF), and finally, the bottom line is the lowest usable frequency (LUF). You will find the best reception along the heavy middle line. Circuits labeled (P) cross the polar auroral zone. Expect poor reception on these circuits during ionospheric disturbances. Due to the decrease in the sun cycle, the graphs have been adjusted so that the maximum frequency is now 30 MHz instead of 40 MHz.





# what's new?

Larry Miller



## Grove Directory

By now, your 7th edition of the *Grove Shortwave Directory* is probably as dog-eared and annotated as Bob Grove's own. Finally this indispensable guide to two-way communications monitoring in the spectrum below 30 MHz has been published in its 8th updated edition. There are a number of notable changes in this new version, edited by Larry Van Horn.

Vastly revised to follow the new worldwide frequency plans; maritime, military and aircraft communications frequencies around the globe are listed along with Coast Guard, embassies, space programs, federal government, public safety, spy numbers, common carrier, scientific, longwave beacons and even broadcasting.

New this year is a current list of radioteletype and facsimile stations complete with frequencies, call signs and locations, as well as a greatly expanded glossary.

The *SWD* is organized by service, which makes it easy to look up your target of interest. Unlike past editions, this version does not come with a comprehensive by-frequency cross-reference — but don't panic! Sold in a three-ring loose-leaf binder format,

sections such as the frequency cross-reference can be added or updated without having to replace the entire book.

Ask anyone who has used the *SWD*: whether you are a newcomer or an experienced utility DXer, they'll tell you this is one directory you must have.

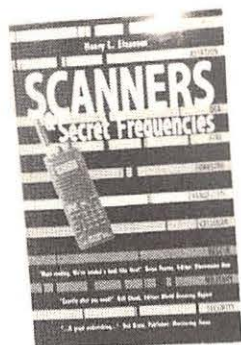
The 256-page *Shortwave Frequency Directory* is \$24.95 plus \$5 from Grove Enterprises (P.O. Box 98, Brasstown, NC 28902; 1-800-438-8155); the looseleaf binder is an additional \$5 if purchased with the book.

## Scanners and Secrets

*Scanners & Secret Frequencies* is a new book by Henry Eisenson that has been aggressively promoted by the publisher. A 320 page paperback, it covers a wide range of scanning subjects from an intro to physics and radio principles to choosing a scanner, the spectrum and more. Author Eisenson conducts the proceedings with warmth and good humor, discussing the hobby as if he was sitting around with friends, swapping tales.

Indeed, this is an enormous, if not eclectic, collection of information. But discerning readers will begin to pick up some disturbing trends. Part of the problem is factual. There are errors. U.S. Radio Data of Lebanon, New Jersey, publishes *Gene Hughes' Original Police Call*, says the book. That's not true. That's not the name of the book and it's published by Hollins Radio Data of Los Angeles, California.

Another example, Miller Publishing, is listed as a source of publications in Thorndale, Pennsylvania. Miller Publishing hasn't been in business for almost half a decade. But there's even a



phone number offered, long ago disconnected, so obviously, the information in the book was not checked. And why is Glenn Hauser's shortwave publication, *DX Listening Digest*, listed in the bibliography?

Some very prominent people apparently received advance copies of this book and made some inappropriate hyperboles about the book's quality. After carefully rereading it, many will undoubtedly wish that they had not been so generous.

One other odd thing caught my eye. There on the front cover amongst the standard "teasers" about what you can hear are "evangelists." Christian readers might rightly be offended not only by being singled out from the myriad occupations which make use of two-way radio, but also at being lumped in with "cults." Amazingly, the author repeatedly warns that scanning evangelists "...can produce...[a] profound...change in the listener's attitude, especially toward organized religion." This is a profound lapse in professional judgement on the part of author Eisenson and publisher Linton Vandiver.

All of this isn't to say that the book is worthless. There's plenty of great reading between the book's rainbow-colored covers. But in the end, the best quote came from an apparently reserved Bob Grove who summed things up perfectly by describing the book (quoted on the front cover) as "...A giant undertaking..." That's true enough.

*Scanners & Secret Frequencies* is available from Index Publishing Group (3368 Governor Drive, Suite 273F, San Diego, CA 92122; 619-281-2957) for \$19.95.

## M Street

If you're looking for a reason to celebrate Thanksgiving, an excuse just arrived. The new *M Street Radio Directory* is out and it covers U.S. and Canadian AM and FM broadcasting like a blanket. The *M Street Radio Directory* is an absolute feast for anyone who enjoys AM and FM radio.

Stations are listed according to state and each station gets a mini-profile, including power, antenna height, ownership, address, format, phone number and more. Next is a listing by call sign so that you can quickly identify those DX catches. Then there's a by-frequency listing, stations arranged by market, networks, and even a station fax phone directory.



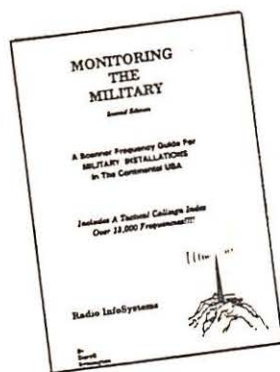
And the information is very hot. (There are 500 updates posted to the database every week!) Oh, and don't miss Ray Rosenblum's refreshingly realistic article on buying your first radio station or Sean Ross' irreverent look at the state-of-the-industry.

Of all the books available to the radio professional, listener, or hobbyist, this is the absolute best, the standard upon which all others should be judged. Get your copy today. It's \$32.95 plus \$4.00 shipping from M Street, 304 Park Avenue S, Fl. 7, New York, New York 10010.

## Monitoring the Military

Another excellent book, *Monitoring the Military*, by Daryll Symington, is for people





who want to use their scanners to keep an ear on Uncle Sam. Military bases are arranged alphabetically and each listing is crammed full of information including over 13,000 frequencies.

In fact, the new 2nd edition of the book is 20% bigger (144 pages), has a nicer, more readable layout, and it's still the same price as the first edition. This edition includes many new installations and an index by state. Long-time users of the book will also notice that the ICAO identifier (where applicable), as well as the specific geographical coordinates, are now included.

This is an excellent book that will satisfy the soul of any U.S. Military monitor. Get your copy for \$16.95 from Grove Enterprises or any *Monitoring Times* advertiser.

## Build Your Own

Those who count themselves among the refugees of an earlier age will want to get a copy of *Radio Receivers Projects You Can Build*. Written by Homer Davidson, the TV Servicing consultant for *Electronic Servicing & Technology* magazine, the book shows how to build all kinds of receivers from Marconi-era crystal sets (that don't need a power source!) to those using the very latest IC technology.

Says the author, "For a fraction of the cost of store-bought units, readers can also build, tune, and operate regeneration and shortwave radios capable of pulling in signals from all over

the world."

There's even an index showing sources for all the parts and components that you'll need. To get your copy, contact your favorite radio bookseller or send \$18.95 to Tab Books, Blue Ridge Summit, PA 17294-0850 or call 1-717-794-2191. Tell 'em *MT* sent you.

## Tape Activator

If ever a market seemed saturated, it's the one that manufactures and sells radio/tape recorder controllers. There seem to be at least a dozen on the market and they vary in performance as well as price.

Worldcom Technology has entered this very competitive market with a unit that "patches" your scanner to your tape recorder, automatically activating your tape recorder whenever your scanner picks up a signal. What makes the Worldcom Technology unit different is that it reportedly uses no batteries and does not require any external power.

The price is \$33.95 plus \$4.00 shipping. If you'd like to get more information on this new unit, contact Worldcom Technologies at P.O. Box 3364, Ft. Pierce, Florida 34948 or call 1-407-466-4640.

## SWL TV DX Certificates

TV DXing is one of the hobby's more esoteric facets. Despite my revulsion of all things video, I'll make an exception to stare at a glowing blue cathode tube swirling with snow, just on the off chance that something will wind its way in from Florida or, some destination equally exotic. *Amateur Television Quarterly*, a magazine designed primarily for hams who operate their own TV stations, is trying to encourage this practice by offering a callsign (for non-hams) and certificate program for those who indulge in this pastime.

Called "TV Quest," radio hobbyists can receive recognition

## AR-33B VHF FM RECEIVER

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- No birdies 140-170MHz.
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for pulling in distant TV stations by paying a "modest" but unspecified fee. To get involved, contact Henry Ruh at ATVQ, 540 E. Oakton St., Des Plaines, IL 60018 or call 708-298-2269.



## A Window into Pakratt

AEA is now offering what they call "the first and only data controller program for Microsoft Windows." **Pakratt for Windows** is a full-featured Windows application for controlling the entire AEA family of data controllers, including the industry

standard PK-232MBX, PK-88 and PCB-88.

The PC Pakratt for Windows supports standard control program features such as split screen option, binary file transfers, QSO loggings, macro facilities, on-screen status display, and much more. Suggested price for PC Pakratt for Windows is \$129.00 and it is available from your favorite amateur radio dealer.

## Sneak Preview

*Monitoring Times* learned only a week before its convention that R.L. Drake Co. planned a surprise introduction there of a new shortwave receiver. The SW-8, only speculated about in the 1994 *Passport to World Band Radio* (where it is called the SWL8), is a portable desktop shortwave receiver, retailing for slightly less than \$700. Watch for our impressions in the next issue.



# Product Review:

## Grove Spectrum Analyzer Model SDU-100

Guest review by Michael Esposito

"See the U.S.A. in your Chevrolet." Many will remember this popular jingle from the fifties and the sixties challenging new car buyers to get out and "see the world" in this marvelous driving tool.

These days, Grove Enterprises is also inviting people to see the world, but from a new and exciting perspective which relates to our hobby of scanner and shortwave radio listening. It's not your 50's or 60's Chevy, but it's just as exciting — and considerably less expensive!

Grove's tool for gaining this new perspective on the radio bands is the SDU-100 spectrum display unit which can visually observe a portion of the radio spectrum from 100 kHz to 10 MHz wide. It's very much at home with top-notch communications receivers like the Icom R-7000, R-7100 and R-9000.

Watch signals pop up from nowhere — some so brief that you would not be aware of their presence if you were using only a conventional scanner. Atmospheric and man-made noise suddenly descend upon patches of frequency ranges like locusts, only to disappear as suddenly as they come.

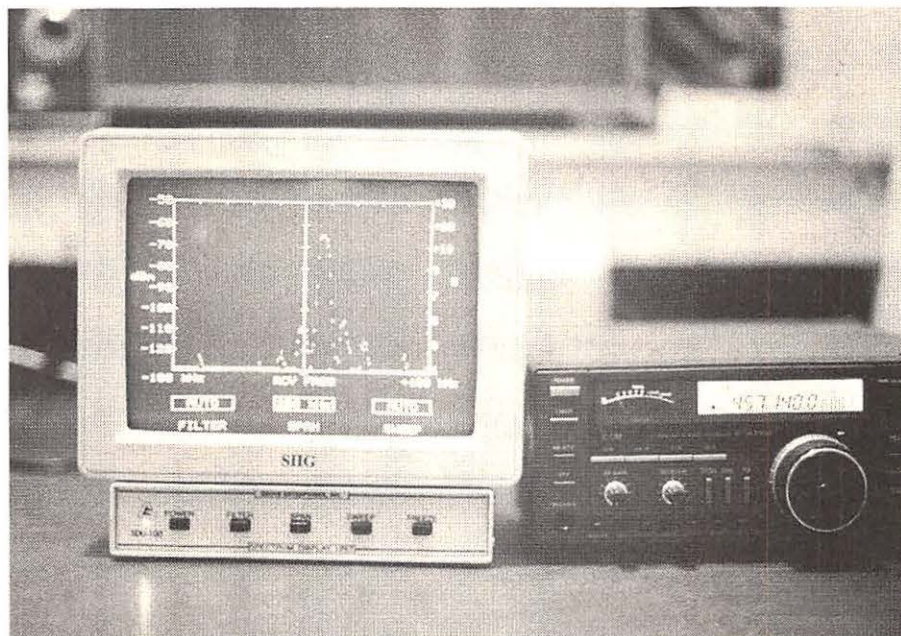
That may sound a bit dramatic, but it conveys the feeling of wonder I experienced when I first saw what the radio spectrum looks like! You can use these visual clues of "radio activity" to quickly "zoom in" on signals that would elude you if you were using only conventional listening techniques.

A communications receiver generally listens to one frequency at a time. Even a sophisticated, thousand channel scanning receiver provides us with only single-frequency listening.

While the Grove SDU won't let us *listen* to more than one frequency at a time, it does permit us to *see* the signals in a significant portion of the radio spectrum all at one time.

Many years ago a good friend lugged a mysterious-looking device into my shack. At a cost of some \$10,000-15,000, this spectrum analyzer had a built-in receiver with an oscilloscope screen which produced wave forms that corresponded to the radio traffic we were monitoring. When a blip appeared off the center of the screen, we quickly tuned into this new signal.

The Grove SDU operates much the same way, but Grove has scaled down the cost to make it affordable to shortwave and scanner enthusiasts. At the same time, the unit is so easy to operate



that no time is lost hunting for those elusive signals and frequencies.

To use the Grove SDU you will require a shortwave or scanner receiver with an "I.F." output jack. The Grove unit is small enough to squeeze into any shack — its footprint is a mere 8" x 10" and comes with the necessary cabling to attach to your receiver.

When you order your spectrum analyzer, you must indicate the "I.F." (intermediate frequency) of your receiver or state the model. I used mine with an Icom R-7000 and an R-9000 receiver.

My Icom R-9000 already has a built-in spectrum scope; however, its narrow 200 kHz span (viewing window), while OK for some shortwave work, is relatively useless for VHF and UHF monitoring because signals there are not crammed as close together as they are on shortwave. Hence, to gain maximum effectiveness from the technology of the spectrum analyzer, you need a unit like the Grove, which has a much wider span.

The 10 MHz maximum spread on the Grove provides a more than adequate look at the radio spectrum, and the viewing widths can be scaled down by pushbutton control to do "closeup" looks at narrower ranges of frequencies (5, 2, 1, 0.5, 0.2 and 0.1 MHz).

A 9" TTL monochrome monitor is available at a discount from Grove when you purchase the spectrum analyzer unit; it's small enough to sit atop the analyzer, yet of sufficient resolution to be used continuously without eye fatigue. Its swivel base also allows for optimum positioning in a number of configurations.

When you power up the Grove unit, a vertical

center line is generated which shows gradations corresponding to scales on the left (dB) and right (S units) sides of the screen. A horizontal scale corresponds to spectral frequency increments. Indicators on the bottom of the screen show your chosen span, filter bandwidth and sweep speed (similar to the "gate" time of a frequency counter; it determines how often the spectrum is sampled and displayed on your unit). A switch is also provided to freeze the display so that you may study various waveforms.

Combined with a power switch and LED indicator, the front panel layout is ergonomically correct and simple to operate.

### Let's Fire It Up

For the purpose of this evaluation, I ordered the Grove SDU-100 Spectrum Analyzer and VID-100 video display. I had already prepared an area next to my receiver to accommodate the pair.

Setup was quick and easy. The analyzer and matching video display are supplied with a plug-in wall transformer, hook-up cable and instruction manual.

When the unit is turned on, the system defaults to the wide (10 MHz) span; automatic sweep speed and bandwidth select the optimum settings for the desired frequency spread. All settings may be manually overridden for maximum flexibility.

Instructions are also provided to fine-tune the system to your receiver; this includes adjusting the SDU sensitivity to match your receiver's meter, and centering the display of the primary



## The Television *Gray* Market

by Henry Eisonson

The truth about cable theft!

Exactly what you were afraid to hear about theft of cable, satellite, and videotape programming. Yes, **YOU** pay for the industry that steals satellite and cable services! This new 160-page bestseller discusses television's hidden underground businesses, chips and test devices, bootleg converter boxes, the law, modifications, and industry countermeasures. Dialogs with gray market buyers and sellers! It actually identifies hundreds of dealers in products, services, and information. Much previously unknown or forbidden "underground" information. If cable bills bother you, this book is a **MUST!** ALA's *Booklist* calls it "Controversial, but of high interest." *You bet it is!*

\$23.75

## Underground Database

\$23.75

Whether you're an expert or beginner, prefer police calls or listening to private conversations, this new 320 page book will help you select and enjoy your scanner. Here's how to listen to things you were never intended to hear, and the law is explained, too. It includes frequency lists, product specs and comments, lists of books/magazines/clubs, and much more. If you're fascinated by the residents of the spectrum, such as the police, public safety agencies, the government, aviation... or want to know what's going on around you, or are just plain *nosy*, you'll love this book.

The first comprehensive, complete handbook on scanning — it's exactly what the experts call it!

"...broad in scope and authoritative..." Bob Grove, *Monitoring Times*

"Absolutely the best..." Norm Schrein, "Mr. Scanner"

"...must reading..." Brian Fenton, *Electronics Now*

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"...comprehensive, no nonsense..." Bill Cheek, *World Scanner Report*

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signal. This is done by way of two potentiometers on the rear of the unit. In addition, the front panel controls double as special "soft-key" centering calibrators. You may not have to make any of these adjustments but, if you do, it's a lot simpler than it sounds. Grove even supplies an adjustment tool!

The Grove unit is "digital"; the waveforms are not continuous lines, but a series of dots. At the 10 MHz spread, the resolution does not produce a full waveform — what you observe are the "peaks" of the signal spikes.

The wide 10 MHz span is useful for observing less congested frequency spectra like the 406-420 MHz government band or the 225-400 MHz UHF military aircraft band. The more narrow resolutions, on the other hand, are better suited for the congested VHF/UHF and shortwave bands.

During my first night with the Grove system, I surveyed a number of VHF and UHF government bands used in my area whose activity had eluded my detection. I soon mastered the technique of spinning my R-7000 dial well enough to zero right in on those signals as soon as they transmitted.

I quickly learned to differentiate between the "signatures" that various signals display; I can now recognize TV stations, paging stations, unmodulated carriers, and much more just by

looking at the SDU screen in the narrower 100 Hz-1 MHz ranges. In the wider 2, 5 and 10 MHz ranges, the waveforms' signatures become a little less distinct; nevertheless, there is still an excellent indication of signal presence. Once you've mastered the system, you'll wonder how you ever got along without it!

A word of warning: The combination of viewing, tuning and listening can become very addicting! Sure, there are other ways of catching elusive signals without a spectrum analyzer. If your radio has automatic search and store functions, you could utilize these methods; you could also program large chunks of suspect frequencies into your scanner and do a lot of listening.....to nothing! But these methods are time consuming and cumbersome. The Grove SDU takes most of the guesswork out of frequency exploration; it's the way the real pros do it!

The Grove Spectrum Analyzer, model SDU-100, is available from Grove Enterprises, Inc., Brasstown, North Carolina. The price of the analyzer unit is \$499.95 (plus \$8 UPS shipping). The optional 9 inch CRT monitor is \$149.95 (\$8.50 UPS). When purchased together, a special system discount price applies: \$599.95 (\$12.50 UPS). The unit is backed by a one year limited parts and labor warranty.

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MONITORING TIMES

## Scanners & Secret Frequencies

FOREWORD BY  
BILL CHEEK!

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## Uniden BC8500XLT Desktop Scanner

It has been more than ten years since Electra, the former parent company of the Bearcat scanner line, conceived a full-featured, desktop scanner for discriminating listeners. Whispered among the inner circle as the BC1000, the project was placed on hiatus when the company was sold to Uniden.

Now, after an extended introductory delay, this wide-frequency coverage desktop scanner with a tuning dial has been resurrected, though vastly changed in concept and renamed the BC8500XLT.

Identical in appearance and almost identical in function to the recently-released BC890XLT, the 8500 also is wrapped in a steel cabinet and measures 10-1/2"W x 3-1/2"H x 7-1/2"D; it weighs just under 4 pounds.

The rear panel is equipped with a BNC antenna jack, RCA phono jack (marked "AUX") for tape recording, a lock switch to prevent accidental panel entries, and a 12 volt DC jack to accommodate the AC wall adaptor (included) as well as to allow the unit to be connected to a vehicle battery line.

Like the popular BC760XLT mobile scanner, the 8500 offers a CTCSS (continuous tone coded squelch system) option which allows the squelch to open on designated channels only when it detects a tone used by the desired agency. The CTCSS module was not available for testing at press time.

Frequency range is the widest ever for a Bearcat: 25-550 and 760-1300 MHz continuously, less cellular (unrestorable). Up to 500 memory channels (labelled A through J and 1 through 0) may be stored in 20 banks of 25 channels each.

Each time the scanner is turned on, it defaults to the scan mode, scanning whichever banks were selected when the unit was last used.

A count function reveals the number of times a memory channel was active during the scanning period, while the memory function reminds the user which channels have been programmed, locked out or prioritized in any bank.

The alpha function permits the user to enter a combination of up to 16 letters (upper and lower case), numbers and characters into the first 250 of the 500 memory channels, allowing identifi-

cations like "1st Natl. S & L". If an error is made while "typing" the alpha display, the user must start all over again.

Memory channels may be scanned at a normal 20 per second, or "turbo" scanned at up to 100 channels per second. Up to 10 different priority channels may be assigned, one in each of the first 10 memory banks, on any channel.

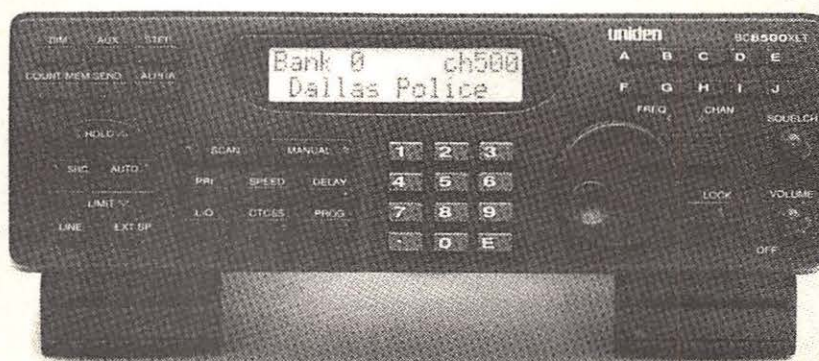
A tuning knob allows any displayed frequency to be slewed continuously higher or lower. All channels (but not individual channels) may be simultaneously selected for two-second delay (or no delay) to await a reply after a signal ceases.

The tuning dial may also be used to step memory channels, up or down, by its rotation.

By pressing the SEND key, any dialed frequency may be automatically inserted into a memory channel.

An autostore feature allows active search-discovered frequencies to be automatically stored into memory; an autosort feature then arranges them in numerical order for faster scanning. Any channels may be temporarily locked out of the scanning sequence without erasing them from memory.

Twenty factory test frequencies may be automatically loaded by holding down the SCAN, 2 and 9 keys while the radio is off, then switched on and the buttons released.



Any channel may be erased simply by entering a zero. All channels may be erased by holding down the MANUAL, 2 and 9 keys while the unit is off, then switched on and the buttons released.

### Our Impressions

#### The Good:

Boldly styled and labelled for simple control identification and access. Rigid metal construction.

Wide frequency coverage, including wideband FM detection of FM and TV audio.

Tuning dial has finger indent and ridged circumference, assuring tactile "feel."

Audio is crisp and powerful (although somewhat "metallic" sounding) from the 3 watt amplifier and 3 inch speaker.

Channels may be individually selected to feed their audio to the tape recorder jack when activated during the scan sequence.

Most keypad routines are familiar without having to refer to the instruction manual. Bearcats are still the simplest scanners to operate in the industry.

Tuning steps are automatically defaulted to the most commonly used in each frequency range:



manual selection of 5, 12.5, 25 and 50 kHz is accessible as well.

LCD legends are easy to read—bold, black and large. The backlight may be bright, dim or off.

The instruction manual is well written and easy to understand.

## The Not So Good:

Poor dynamic range results in the worst intermodulation interference and desensitization from strong-signal overload we have seen in recent years; one well-known Uniden dealer reports a return-for-refund rate of approximately 35% from this cause alone. While the problem is especially severe in metropolitan areas, it is also evident in remote rural areas as well. A simple attenuator switch would have helped dramatically.

All-channel delay doesn't allow the user to select which channels he wants to wait for a reply after a transmission and those which he does not.

It appears that cellular frequencies, still legal to have in scanners until next April 26th, have been unrestorably censored from the 8500.

Modes are not selectable; the user cannot, for example, look for narrowband FM wireless mikes in the FM or TV wideband FM broadcast bands, nor can he listen to FM satellite downlinks in the 225-400 MHz AM military aircraft band.

Alphabetic identification can be used on only 250 of the 500 memory channels; similarly, only the first 10 of the 20 memory banks have the priority feature.

The squelch tail heard when the signal drops out is much noisier than on other Uniden products like the BC855XLT.

When toggling the FREQ/CHAN switch, the display does not change until the tuning dial is turned; the user cannot see the mode, tuning step or bank selection he requested until he turns the dial off the setting he wants to monitor.

## The Bottom Line

The new Uniden BC8500XLT has a number of outstanding features, however mitigated by its shortcomings. But even though a dealer reports one-third of the scanners are being returned by dissatisfied customers, that means that the majority—two-thirds—are satisfied.

The Uniden BC8500XLT is available for \$386.95 plus \$7.50 UPS shipping from Grove Enterprises, and is also available from other MT advertisers.

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The Digital Scrambler Silencer comes in two models: the DSS8 for home use comes with a wall transformer which plugs into an ordinary AC wall outlet, while the DSS8M mobile unit is equipped with an adapter which plugs into the cigarette lighter of the vehicle. In both models, the audio lead which plugs into the scanner's external speaker jack has a phono plug and an adapter to a 1/8" phone plug is supplied.

Each unit is available for \$49.95 plus \$3.00 shipping and handling (U.S. funds). To order, make check or money order payable to "Leisure Electronics" and mail to:

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Manchester, NH 03108-5582

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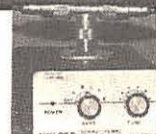
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**THE SHORTWAVE PROTECTOR:** Fights overload interference and static damage! The new Shortwave Protector plugs in between your radio and outdoor antenna. It filters out interference to the shortwave bands caused by local AM, FM, and TV stations, paging transmitters and two-way VHF communications. It also has a unique filter that improves evening reception on the 25, 21, 19, 16, and 13 meter bands, along with a high-gain, low-noise amplifier, 20-dB attenuator, and three levels of fast-acting protection for your radio from damaging lightning-induced surges, nearby transmitters, and static build-up. All filters and functions are front-panel switchable. It comes fully assembled/tested in an attractive RF-tight enclosure for just \$79.95.

**NARROW FM-BROADCAST FILTER SET:** Fights interference from adjacent-frequency FM stations, letting you hear ALL of the weak ones! A must for FM DX'ing! These filters are 1/2 to 2/3rds the bandwidth of the identical-sized stock filters in your radio. The set of two comes with materials and instructions for easy installation into any modern SW receiver capable of FM broadcast reception (specify radio model) for only \$17.95.



## Static Arrestors That Work!

Normally, the thought of a few million volts toasting the air near a world band receiver would send us scrambling to disconnect outdoor antennas and switch off the power bars that connect our electronic beloveds to the wall socket.

But this time, like demented catchers for a celestial baseball team, we're rooting for Zeus to rifle one of his smoldering bolts right through the neighborhood. It's all in the name of science: We've been testing gear designed to protect world band receivers from nearby lightning strikes.

But first, the basics. If you routinely listen with an outdoor antenna and own a costly receiver, you need some sort of lightning protection. Actually, "lightning protection" is a misnomer. *Nothing* will protect your receiver in the event of a direct strike on your antenna. The truth is that most lightning protection systems are designed to protect from *nearby* strikes. A bolt hitting even a few blocks away can generate massive electrical pulses—in an outdoor antenna, and sometimes in the electrical distribution system, too. These can severely damage a receiver, not to mention give you crispy fingertips.

Most lightning protection systems, such as those offered by Alpha Delta, shunt energy from a lightning strike harmlessly to ground. And, as any experienced world band listener or ham can tell you, an even simpler expedient is to disconnect your receiver from the outdoor antenna and wall plug whenever an electrical storm threatens.

### Protects Antenna, Power Line and Telephone

But we sometimes forget to disconnect our receivers when we're done listening. That's where the ILD/P Model 100 Equipment Protection System comes in. Manufactured by Rabun Labs, Inc., and marketed by Ten-Tec, this small box (8 1/4" W x 6 1/4" D x 3" H) connects to your antenna and wall socket. You then connect your receiver to the antenna and power supply through the '100. A 16-20 inch vertical antenna (not supplied, Radio Shack P/N 21-921 with adaptor P/N 278-120 is recommended) is attached to the back of the '100.

Through this little antenna, the '100 detects oncoming electrical storms and automatically disconnects your receiver from *both* the antenna and house current before a lightning strike can do any damage. And if that weren't enough, it also nominally protects your telephone line.



When the '100 activates itself, your receiver remains disconnected for 20 minutes. Then, if the electrical storm is still in the area, the process repeats itself.

Neat idea, but does it work? At first, we didn't know for sure. For two months no electrical storms that passed near our test facility activated the device—although they passed near enough for us to see flashes and hear thunder.

What we eventually found is that the '100 is sophisticated enough to leave well enough alone until the danger is near enough to warrant disconnecting. Storms finally did roll in closer, triggering the '100. It worked, worked well, and has kept on working since.

Ten-Tec (1185 Dolly Parton Highway, Sevierville, TN 37862; 800/833-7373) offers the Model 100 with a 30-day, money-back guarantee for \$295.

### Cheaper: Antenna Arrestor Only

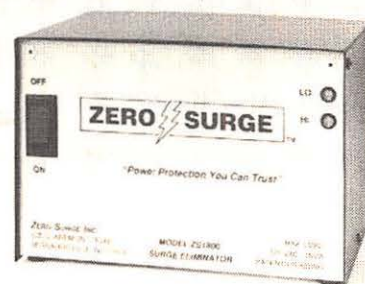
That's pricey, even if it's hard to beat. Yet, between the high cost of the '100 and zero cost of manually disconnecting wires, there are other good options.

The Alpha Delta arrestor, for example. It's only for your antenna, but it works exceptionally well and nothing gets shut down. Using MOVs that last for years—we've had one in use for our main antenna since the late Eighties—it sells for under \$25 at most shortwave specialty stores.

Still not cheap enough? Then buy your antenna with an arrestor built in. Eavesdropper antennas are now sold as being fully protected, and although we haven't tested their particular arrestor, we haven't come across any reports of difficulties, either. Under \$80 at many shortwave specialty outlets.

### Effective Power Line Protectors

That's for your antenna, but what about the power line? As any computer user knows, a serious surge arrestor is small potatoes compared to the protection it offers, and static charges via the power lines cause at least as much damage to shortwave receivers as do unprotected antennas.

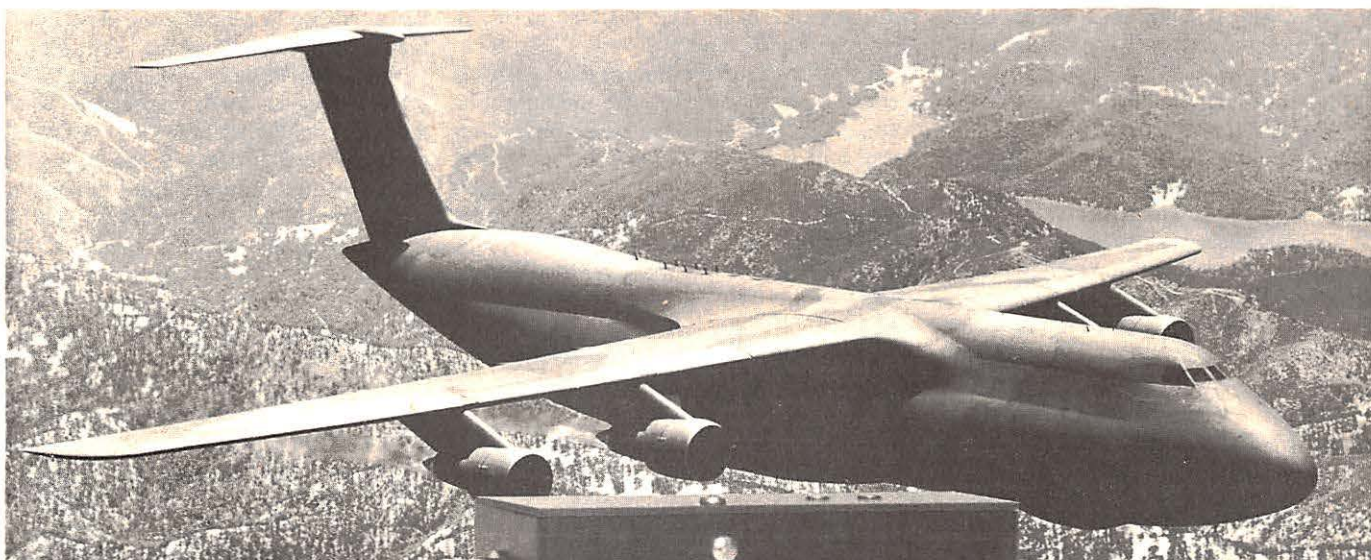


MOV power-line surge arrestors that are highly rated by *PC Magazine* are affordable and proven performers. Additionally, if money is no object, the innovative \$149 Zero Surge Eliminator (103 Claremont Rd., Bernardsville NJ 07924; 908/766-4220) that we have tested extensively performs exceptionally. Unlike conventional power-line suppressors, it stores and slowly bleeds off excess electricity to neutral, rather than shunting it off to ground.

In the United States, Canada and many other advanced countries, there is little need to protect the telephone line if it is properly fused and grounded. Even where such protection is warranted, the protectors offered rarely perform as they should.



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Assembled with surface mount devices and all-metal case, the CVR-4 offers excellent sensitivity (1 microvolt nom.) and out-of-band interference rejection. The on/off switch bypass function allows the unit to be left in line when not in use.

The CVR-4 Scanverter comes with a universal adaptor kit so that it can be connected directly to a

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Operates from standard 9-volt alkaline battery (not included).

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# Seeing is Believing ... And Maybe Logging!

Except for voices, the human system is really quite primitive when it comes to decoding audio signals. Unlike the fellow on *Star Trek - The Next Generation* who has sensors instead of eyes, we do not hear by analyzing the audio frequencies of the sound. Sure, we can distinguish Aunt Louise from Uncle Paul, but when it comes to recognizing standard modes of digitally encoded signals such as radio teletype (RTTY), SITOR, NAVTEX or AMTOR, we humans need help, and lots of it.

Initial identification of the mode being used can sometimes be quite difficult and time consuming. Even with "smart" signal identification software, correct tuning is necessary for IDing and decoding. An oscilloscope can be helpful to zero in on RTTY tuning.

But what if we had an instrument that listened to the signal and displayed the range of individual frequencies it "heard." Looking at this spectrum break-down, we could see important information such as: the number of tones in the signal, the frequency between tones (called the shift), and the relative amplitude of the tones.

Well, such an instrument is called an audio spectrum analyzer and it has been around for years. So why don't we see them in listening and ham shacks? How about a price tag starting at \$2000 and going up to the \$10,000 level!

That's it, Catalano; get our appetite all whetted and then burst the bubble with an impossibly high cost. Well, thanks to John Pattee at Pioneer Hill Software, that cost has been dramatically reduced. Let's see how recent developments in the computer world have enabled this development.

In case you haven't noticed, in the past year a new PC accessory card has been added to the list: the sound card. Starting at around \$70, these sound cards come from various manufacturers and have such names as Thunder Board, Sound Blaster and AD Lib. Their function is to decode digital information into high fidelity synthesized sound. Instead of hearing game sounds

over the tiny speaker inside your PC, it is amplified by the sound card for playback by a full range speaker. The added sound fidelity dramatically increases the realism of many simulations and games.

A little used feature of these sound cards is a sound input jack which, with the right software, will digitize user-supplied audio. Our friend John Pattee decided that this sound card would provide an excellent and inexpensive building block around which to write audio analysis programs. And so the power of the audio spectrum analyzer was given unto us common radio folk.

## Pioneer Hill Software's Audio Spectrum Analyzer

The required minimum in the way of a computer system is a 386 20MHz AT capable of running Microsoft's Windows 3.1; and as I mentioned, a sound card. The price of the well-known names has dropped to such a reasonable level, I don't think that it is worth the risk of buying a cheaper non-brand sound card. The ones I have mentioned are all guaranteed to be compatible with the standard. Take care with any others. The recorder output of a receiver is then connected to the input of the sound card using shielded cable and the hardware installation is complete!

Pioneer Hill offers two spectrum programs: Audio Spectrum Analyzer version 1.0 at \$39 and Spectra Plus at \$129 (a price increase is due 1 Jan 94). The two programs are very similar in their basic spectrum operation; the Plus version has expanded capabilities such as record/playback/analyze and manipulation of previously "recorded" spectrums. For this review I will use Spectra Plus.

Even with excellent decoding systems such as AEA's PK-232 or Software Systems Consulting's PC SWL, some stations are not using standard modes and therefore cannot be

decoded! In fact, as desk top computers become more powerful, more stations are using non-standard encoding modes for security reasons. Say good-bye to decoding the majority of the digital signals outside of the ham bands.

**BUT WAIT!** Just suppose we could "finger print" the signals by their spectrum types. Although we couldn't decode the information into plain text, we could classify, catalog and log the signals by their spectrum. Keep this in mind as we go through the operation of Spectra Plus.

The program should be copied to a hard drive's sub-directory before it is run. Then using Windows 3.1 the program is started. The user is given three screen/operational choices: real time display of information as it is going into the computer, recorder-playback mode and post-processing, which allows the user to manipulate the sounds as if they were data bits, which of course they are! Although the last is of great creative interest, we'll just look at the functioning of the other two.

The user can control the gain (think of it as volume control) of the resulting graph and other "scaling" values via one of the pull-down titles which sit at the top of the screen. Many other features are possible from these functional titles, such as control of the mathematical formula which is used to create the spectrum, sending what is being viewed to a printer for a hard copy, saving to disk (if in the recorder mode) the 30 to 180 seconds of sounds you have just recorded, playing back previously saved files, and choosing how the spectral information is to be viewed.

To avoid getting too involved, we are just going to use the Spectra Plot view: a two dimensional view with the vertical axis of the graph indicating the amplitude of the signal (see any of the graphs). Let's "take a picture" of a radio teletype RTTY signal in the 20 meter Ham band, as in Figure 1, and analyze the spectral information.

The two peaks are the two tones which RTTY mode uses to transmit information. On

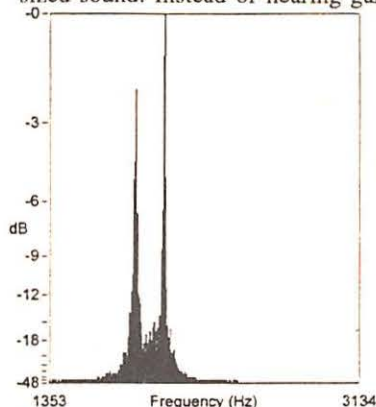


Figure 1: RTTY Signal 170Hz Shift—Ham

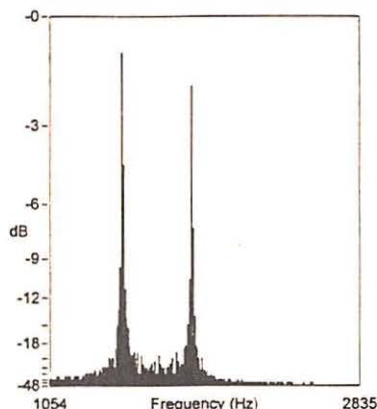


Figure 2: RTTY Meteo 400 Hz Shift

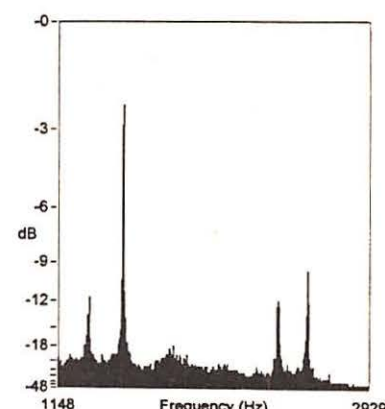


Figure 3: Two RTTY Signals



the graph the distance between the two peaks can be seen to be 170 hertz. When the graph is displayed on the screen, the mouse can be used to take measurements. Position the cursor on the top of the left peak; hold down the right mouse button and drag the cursor to the top of the right peak. The screen will display the amplitude and difference in frequency between the two peaks. No guess work here!

Figure 2 shows another RTTY signal, this time from Bracknell Meteo. Did you notice that the distance between the peaks is twice as wide as that in Figure 1? You have just visually determined the shift of this RTTY signal as being approximately two times 170 Hz. If we measure with the mouse or a ruler we'll find that it is 400 Hz; exactly what it should be according to Ferrell's *Confidential Frequency List*.

The absolute position of the peaks on the horizontal axis can be moved by tuning the receiver, making the beat tone go higher or lower in frequency. The ones shown in these examples are at the frequencies my PK-232 could decode (where possible). This is actually determined by the filters in the decoder unit and the receiver. Therefore a side benefit of this program is its ability to measure the min/max frequency response and shape of audio filters used in our communications and audio equipment.

Figure 3 shows two RTTY signals being received at the same time. To the human ear this is interference in the making. How quickly we get used to seeing signals! On closer observation we can tell that both signals have 170 Hz shifts; probably hams again.

What do SITOR, used by marine stations, and AMTOR, used by hams, look like? Figure 4 is station WOM sending a traffic list of ships for which it is holding messages. Notice that the width and detail in the bottom of these SITOR peaks appear to be more complex than the RTTY signals. Also we can "see" that WOM's shift appears to be greater than 170 Hz.

Remember our earlier discussion about cataloging encoded, or non-standard signals? We'll check out the signal at 5.0235 MHz in Figure 5. From the buzzsaw sound, this could be Time Domain Multiplexing, TDM. But my equipment could not decode it. It almost seems as if there are two main signals separated by 800 or 1000 Hz with many signals on either side. I'm not sure what it is but I'll be looking for it on other frequencies. In this way we can at least keep track of signals even if we cannot decode them; this is the kind of sleuth work that delights ute listeners!

Using Spectra Plus these signals can be saved and then played back, both visually on a graph and over the speaker attached to the sound card. The playback is just like a tape or video recorder with fast forward, rewind and stop functions. The playback can be positioned in time to any part; for example, the part of the signal between 20 and 30 seconds into the "recording" can be displayed and listened to. Hearing WWV, RTTY and hams coming over the computer is a bit startling the first time. But like all new technology you get used to it very quickly and begin to think of your computer as a digital sound recorder.

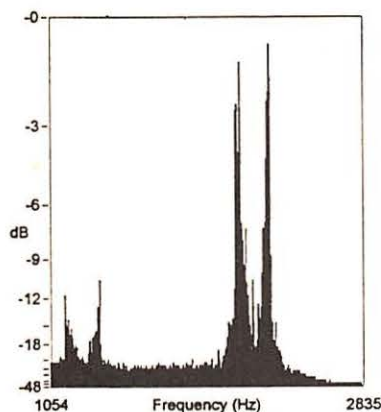


Figure 4: SITOR WOM

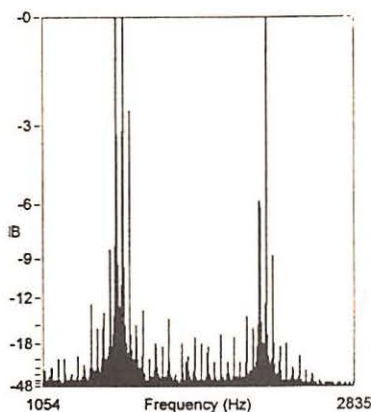


Figure 5: Unknown Signal Fingerprint

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Most ICOM and Kenwood radios - consult your radio's owners manual.

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If you already own a sound card, the Spectra Plus is excellent value for money at \$129 (till 1 Jan 94). If you just want to get your feet wet, the \$39 Audio Spectrum Analyzer is a real good start for about the price of a medium-cost game these days. If you think you have a use for this type of instrument go for the Spectra Plus with its many more recording and post processing features. Both programs are available from Pioneer Hill Software, 24460 Mason Road, Poulsbo, WA 98370, Telephone (206) 697-3472; and mention MT's "Computer and Radios."

The purchase of a sound card and speakers will be a welcome addition to your PC for use with Spectra Plus and/or most flight simulations and adventure games such as "Where In the World is Carmen Sandiego." Stores like SAM's or BJ's member discount stores have had name brand sound cards at \$70. It was a stroke of brilliance on the part of Pioneer Hill to use the capabilities of a mass-produced, and therefore relatively low cost, sound card to do the work that their program required. They have truly produced a "ground-breaking" and valuable program.

Next month we'll try getting out from under the mountain of new communication related software and upgrades of programs that have been flowing in. Also in the coming months we'll be answering the most asked questions of a group of VIPs, my readers. 'Til next time, when together we'll "see" more of the future (and signals) developing before our eyes.

MT



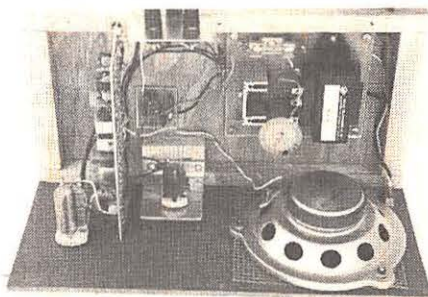
## Build a BC-Band DX Receiver

In part 1 of this article we examined the circuit for a broadcast band DX receiver and explained the function of each stage. This month we will focus on the construction and packaging of the receiver. No special tools are needed for making the chassis and panel. Figure 1 shows a photograph of the assembled unit, minus the cabinet.

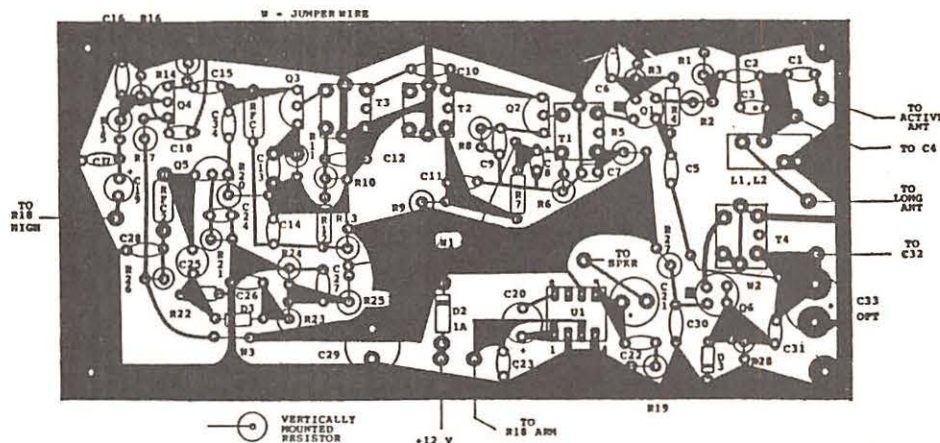
### PC Board and Parts Placement

Figure 2 contains a scale pattern for the etched circuit board as viewed from the etched side of the board. Single-sided board material is used. Etched, plated and drilled boards for this project are available from FAR Circuits (see Part 1).\*

A not-to-scale parts placement guide is provided in Figure 3. The x-ray presentation is seen from the component side of the board. Make



**Figure 1:** Interior photograph of the completed receiver. A homemade 12-V dc power supply is seen at the left. C32 is at the top center on an aluminum L bracket. C4 is at the upper right. The main PC board is mounted vertically at the far right. The small PC board to the left of the main board is the active antenna of Figure 4. Binding posts are seen at the lower center. They are for connecting an earth ground and two types of antennas (see text).



**Figure 3:** Parts-placement template for the receiver as viewed from the component side of the board.

certain that all components are mounted snugly against the board before soldering them into position. Excessive lead length can cause self-oscillations and poor performance.

### Construction Tips

If you etch your own PC board you may use a no. 59 or 60 drill to provide holes for the component leads. A 1/16 inch drill is required for making the mounting-tab holes for the IF transformers.

Locate the Q1 and Q6 end of the circuit board close to tuning capacitors C4 and C32 in order to keep their connecting leads as short as practicable.

L1 and L2 are wound on an Amidon Assoc. FT-82-61 ferrite toroid core. Total inductance for this high-Q transformer is 600  $\mu$ H. L2 consists of 78 turns of no. 28 enamel wire. L1 contains 10 turns of no. 28 wire over the grounded end of L2. Mount the toroid vertically on the PC board to conserve space.

I used a piece of a plastic TV receiver cabinet for the front panel seen in Figure 1. Masonite is a suitable substitute. You may prefer to use an aluminum panel, or one made from galvanized furnace ducting metal. The chassis is a piece of 1/4-inch plywood and the 1-inch-square rails are made from white pine lumber. I used 1/4-inch plywood for my cabinet and covered it with wood-grain contact paper.

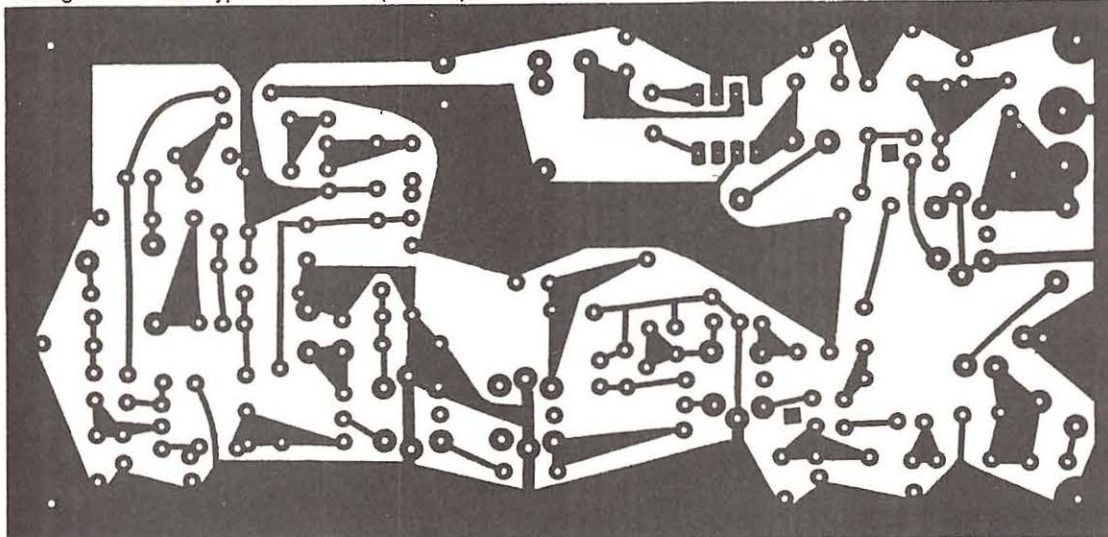
Three binding posts are used at the rear of the chassis. One is for connecting an earth ground to the ground bus of the receiver, one is for direct connection to a long external antenna and the third connector is for attaching a short wire to the built-in active antenna seen in Figure 1.

If you contemplate using contact paper to finish your cabinet, I recommend that you use a wood sealer or two coatings of clear varnish to seal the pores in the wood. This ensures that the contact paper will adhere securely to the wood. The wood should be sanded to a smooth finish before applying the varnish.

### Speaker Details

I spend a lot of time listening to Big Band music while using this radio. Audio quality is, therefore, an important consideration. My receiver has a wide-range, 5-inch speaker with a fairly large magnet. Excellent fidelity is had with the LM-386 audio amplifier and this speaker, even at high volume levels. Try to avoid using a cheap speaker with a low audio-power rating, such as a 300-mW type.

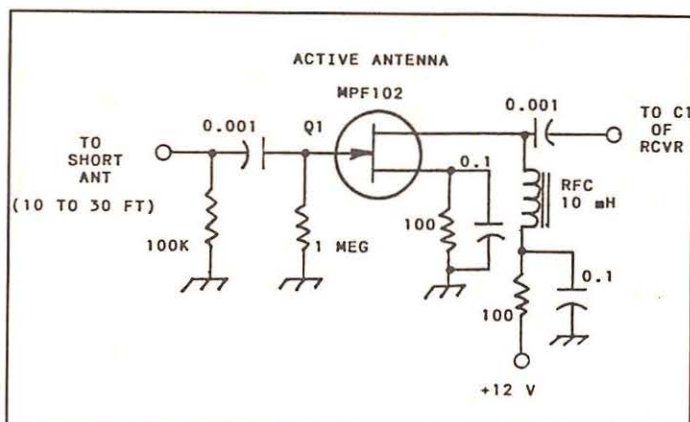
Best audio quality will be had if you use a cabinet for your radio. The addition of my cabinet led to a marked improvement in the bass



**Figure 2:** Scale pattern for the receiver PC board as viewed from the etched side.



**Figure 4:** Circuit for the active antenna. Resistors are 1/4-W carbon film or carbon composition. Decimal-value capacitors are in  $\mu\text{F}$ . Others are in pF. Capacitors are 50- or 100-V disc ceramic.



response of the speaker. An 8-ohm speaker is recommended.

The grill protector material in my radio is a section of brown perforated plastic. This material is available in small sheets at craft shops. I paid 90 cents for one square foot of the material. It is available in various colors. I use light brown grill plastic with my dark brown panel.

### Active Antenna

Figure 4 shows the circuit for an active antenna that is designed especially for this receiver. It is left activated even when it is not used. It draws only 3 mA of current. You can build the circuit on a small piece of Perfboard or use point-to-point "ugly construction." Keep all leads short and direct. You may obtain the 10-mH mini RF choke for this and the main receiver from Hosfelt Electronics for 20 cents.

### Tuneup

Tune in a moderately weak signal and adjust each IF transformer slug for maximum signal response. Next, set oscillator tuning capacitor C32 to minimum capacitance. Adjust the red core of T4 slowly until you hear a BC-band station near 1600 kHz. When C32 is set for maximum capacitance, or nearly so, you will hear stations near 550 kHz. Always adjust peaking capacitor C4 for maximum signal strength after the desired station is selected.

### Closing Comments

I'm sure you will enjoy using this receiver as much as I do. There is a feeling of pride when you construct your own DX receiver. Those distant stations you log will seem pretty special if you catch them with your home-made signal scoop!

Please include a stamped return envelope when writing for technical advice. I receive as many as 20 letters of inquiry each week and am not able to answer any request that is not accompanied by an s.a.s.e.

*M<sub>T</sub>*

\*For a reprint of part 1, send \$2 and an SASE to Monitoring Times and ask for Demaw's Workbench, October '93.

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## Proper Care and Feeding of NiCd Cells

When it comes to the proper care and feeding of nickel-cadmium batteries, much of our modern understanding ranks among the best of myth, fantasy and fiction. The chemical symbols for nickel and cadmium, *Ni* and *Cd*, are usually combined and pronounced "nigh-cad."

The most prevalent myth regarding NiCd batteries is the so-called "memory effect," the theory that these cells can remember improper charge and, after a while, fail to charge fully. The cure was to completely discharge and recharge the cells several times to restore full-charge capacity.

A few years ago, NASA commissioned Gates and General Electric to perform NiCd research, the results of which gave no evidence of memory effect. The studies elucidated several other facts as well:

1. A NiCd cell is considered to be fully charged when its terminals measure 1.44 volts, and fully discharged at 1.0 volt. The nominal 1.22 volts can be considered its half-life.
2. Temperature and overcharge are the greatest enemies of NiCds. A cell that's quite warm to the touch is being charged or discharged at an excessive rate, and will be damaged if left for very long.
3. NiCd cells may be safely "quick charged" at a rate of not more than 1/3 the ampere/hour specification of the cell. A AA cell with a 600 mA/h rating can be charged at 200 mA (0.2-ampere). This is called the C/3 recharge rate.
4. It is best to trickle charge your NiCd cells at about 1/10 the amp/hr specification of the cell, or for the 600 mA/h cell, not more than 60 mA (0.06 ampere, the C/10 rate). NiCd cells may be trickle-charged for an indefinite

period of time without damage. A quick-charge may take only 4-8 hours, while a trickle charge requires 14-18 hours to fully recharge a discharged pack.

The cells of most NiCd packs are connected in series (+ to -, etc.) and have a mA/h charge rating of that of a single cell, since the current through one cell goes through each of all series cells. The total battery pack voltage is equal to the sum of the voltages of the individual cells. A typical Bearcat or Realistic® handheld scanner uses six AA NiCd cells, so if a NiCd cell is fully charged at 1.44 volts, a 6-pack of fully charged cells should measure about  $1.44 \times 6 = 8.64$  volts. The same 6-pack when fully discharged should measure about 6.0 volts ( $1.0 \times 6 = 6.0$  volts). Handheld radios with four cells will measure 4 volts (discharged) to 5.76 volts (charged).

Extremely deep discharging of NiCd cells will permanently damage them, so most manufacturers incorporate voltage sensing circuits to turn radios off when the supply voltage decays to a preset level, and damage can result as well if discharged NiCd cells are not immediately recharged!

Table 1: RESULTS OF A TYPICAL RECHARGE OF NiCd CELLS

Description of Measurement	Test Measurements				
	A Prior to Connection	B Start of Test	C 30-mins After Start	D 2 1/2-hrs After Start	E 20-hrs After Start
Voltage of 6-cell NiCd pack:	7.34-v	7.34-v	7.79-v	8.15-v	8.33-v
Voltage per cell:	1.22-v	1.22-v	1.30-v	1.36-v	1.388-v
AC/DC Adapter Output:	11.13-v	10.23-v	10.25-v	10.21-v	10.33-v
Recharge Current:	n/a.	48.0-mA	38.0-mA	30.8-mA	28.2-mA
Voltage drop across silicon diode:	n/a.	0.740-v	0.735-v	0.732-v	0.722-v
Voltage drop across 39-Ω resistor:	n/a.	1.84-v	1.46-v	1.19-v	1.13-v
Net recharge voltage to NiCd pack:	n/a.	7.65-v	8.05-v	8.28-v	8.48-v

**Discussion of Data:** Refer to Figure 1 for the test circuit (EMI coils were not used)

### Col Discussion

**A:** Just prior to start of test. Grabbed a 6-pak of NiCds off the shelf; measured them and the voltage of the recharger before connecting.

**B:** Initial measurements at start of test immediately after connecting the NiCd pack.

**C:** Recharge current dropped 21%; pack charge increased 6%

**D:** Recharge current dropped another 19%; pack charge increased another 5%.

**E:** Recharge current stabilized to 59% of starting; pack charge stable at 13% total increase.

**Conclusion:** Excessive time is required by factory recharge circuits to achieve a partial recharge to 96% full. Actual results of recharge will be worse than shown above because of an additional series resistance in the recharge circuit in the form of two coils and electromechanical connections between external recharger and internal battery pack. The effective series resistance in a real PRO-34 recharger circuit is about 2Ω more than the 39Ω used in the above test.

Table 2: PARTS LIST FOR NiCd SAFE-CHARGER

Circuit Symbol	Description w/ RS Cat #	Circuit Symbol	Description w/ RS Cat #
F-1a	Fuseholder, 270-364	R-3	560-Ω, 271-020
F-1	Fuse, 1-a, 270-1273	R-4	7.2-kΩ; 271-028 + 271-029
S-1,2	SPST Switch, choice	Ra	See text
T-1	Pwr Transformer, 273-1511/1512	VR-1	10-kΩ, 15-turn, 271-343
CR-1	Bridge Rectifier, 276-1171	D-1	Diode, 1N5400, 276-1141
C-1	1000-μF/50vdc, 272-1047	IC-1	LM-723 IC chip, 276-1740
C-2	100-pF ceramic, 272-123	Q-1	NPN Transistor, TIP31, 276-2017
C-3	0.001-μF ceramic, 272-126	misc	14-pin DIP socket, 276-1999
LED-1	Light Emitting Diode, choice	misc	metal box, 270-253
R-1	1-kΩ, 271-123	misc	perf board, 276-1395
R-2	1.2-kΩ, 271-024		

### Lab Test

I ran a series of tests to determine why my NiCd packs didn't yield the performance I expected in my PRO-43 and PRO-34 scanners. Figure 1 is a simplified diagram of the internal recharger circuit of the PRO-34, typical of simple recharger circuits. I built a duplicate circuit and used Radio Shack's specified AC/DC Adapter (#273-1455A) to recharge a set of six Realistic® #23-125 AA cells, as might be typical in the PRO-34 scanner. Table 1 reveals that factory specified recharge conditions will not produce fully charged battery packs, yielding poor service and short life.

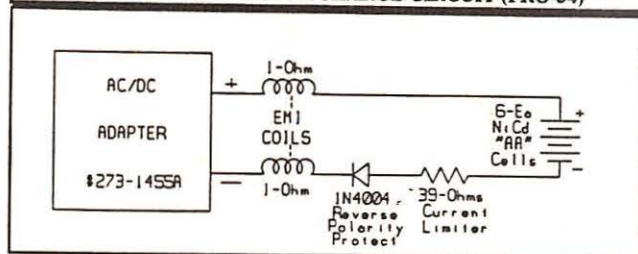
In view of recent disasters (earthquakes, hurricanes, tornadoes and floods), where communications were vital to the preservation of life and property, flashlight batteries which disappear overnight and NiCd packs which prematurely flake out are simply not acceptable. This month I'll show you how to recharge those batteries to proper levels without a risk of overcharging!

Figure 2 is a recharger circuit that can be used for a variety of needs and applications because both voltage limits and current limits are adjustable! The heart of our NiCd SafeCharger is the common LM-723 voltage regulator IC chip which provides a constant regulated voltage output over a selectable range of 2 to 37 vDC, depending on input level.

The LM-723 is severely limited in current output to an absolute maximum of 150 mA (0.15 amps); the chip will self-destruct above this level so use a pass transistor to carry higher currents to your battery packs. The pass transistor can be most any NPN power transistor so long as it is adequately heat sunk; I use the TIP-31 and TIP-120 in several of my rechargers because of the ease with which they can be mounted to a metal chassis for heat sinking. The maximum current needed for heavy-duty D cells will not exceed a half-amp (500 mA) or so at the C/3 charge rates, and AA cells never need more than 200 mA.



FIG-1: TYPICAL NiCd RECHARGE CIRCUIT (PRO-34)



## Circuit Discussion

The NiCAD SafeCharger is not critical in construction and almost any layout will be fine. You should use an IC-socket for the LM-723 to make it easy to replace the chip if it ever blows. The critical parts of this circuit are the trimmer potentiometer for setting the maximum recharge voltage level and the resistor(s) at Ra which serve to set the desired current limiting. It is best that the voltage adjust trimmer be a precision 10 or 15-turn type to afford decimal place accuracy; a 10-turn helipot is preferable. Ra should consist of one or more resistors in parallel to yield an effective resistance to produce the desired current limit according to the formula:

$$R_a = \frac{0.65}{I_L}$$

where IL is the desired current limit, in amps. For example, say you want a maximum current limit of 200 mA (0.2 amps); then we calculate:

$$R_a = \frac{0.65}{0.2} = 3.25\Omega$$

It would be helpful to know how to calculate effective resistance from two more resistors in parallel, so effective resistance is:

$$R_{eff} = \frac{(R_1)(R_2)}{(R_1 + R_2)}$$

Suppose we had a 10Ω and a 5.6Ω resistor, then

$$R_{eff} = \frac{(10)(5.6)}{(10 + 5.6)} = \frac{56}{15.6} = 3.58\Omega$$

which would be okay for the above example.

The above simplified equation is for two resistors only, in parallel, while the following form is for any number of parallel resistors:

$$R_{eff} = \frac{1}{\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \dots + \frac{1}{R_n}}$$

Suppose we had four resistors to parallel: 1, 2, 3, & 4 ohm values; here's how to solve for R-effective of the four:

$$R_{eff} = \frac{1}{\frac{1}{1} + \frac{1}{2} + \frac{1}{3} + \frac{1}{4}} = \frac{1}{\frac{12}{12} + \frac{6}{12} + \frac{4}{12} + \frac{3}{12}} = \frac{1}{\frac{25}{12}} = \frac{12}{25} = 0.480\Omega$$

or about a half ohm!

This example for Ra would limit current output to:  $0.65 \div 0.480 = 1.35$  amps (much too large for NiCds, but maybe about right for gel cells!). Seven 22Ω resistors parallel make an effective resistance of about 3.14Ω, and  $0.65 \div 3.14\Omega = 0.207$  amps or 207-ma, which is about right for the C/3 charge rate of AA NiCd cells. Two 22Ω's in parallel give 11Ω which is perfect for the 60-ma C/10 charge rate of AA NiCd cells. I made up six different Ra resistor values for my

rechargers, and installed them on a 6-pos rotary switch for selectable charge limits of 20, 48, 155, 460, 920 and 1800 ma. The last three values are for recharging my gel cell emergency batteries.

If your recharging requirements cover a wide range of voltages, and if VR-1 does not produce the desired voltage setting, you can use a 10-kΩ potentiometer in place of R-4. Just be sure to set it to roughly 7.2-kΩ for starters and don't deviate far from that value.

Transformer T-1 will be the weakest link in your SafeCharger; if you select one that is rated too lightly, then you'll not get any appreciable current out of the thing for heavier duty needs like gel cells or Heavy Duty NiCds. I specified Radio Shack's #273-1511 or 1512 for a good range of voltage and current, but if your needs are for more than 2-amps, you can parallel two or more of these transformers to double the current capability. For safety's sake, treat the absolute voltage limit per NiCd cell as 1.40-1.43 volts (8.60 volts max, per 6-cell pack) to account for any inaccuracy of your voltmeter.

For portable applications, you don't need the AC power supply. A 12 V car battery can be great for this application. Apply any source of DC to

Point -A- at the LM-723 regulator; just be aware that the LM-723 and the pass transistor will require about 3 volts of whatever the input voltage happens to be.

The specs for recharging gel cells are similar to those for NiCd's (C/3 and C/10), except not as critical. The important criteria for gel cells is the voltage limit! 12-volt gel cells may be fast-charged at up to 14.4 volts and float charged indefinitely at 13.7 volts (1/2 those values for 6-volt gel cells).

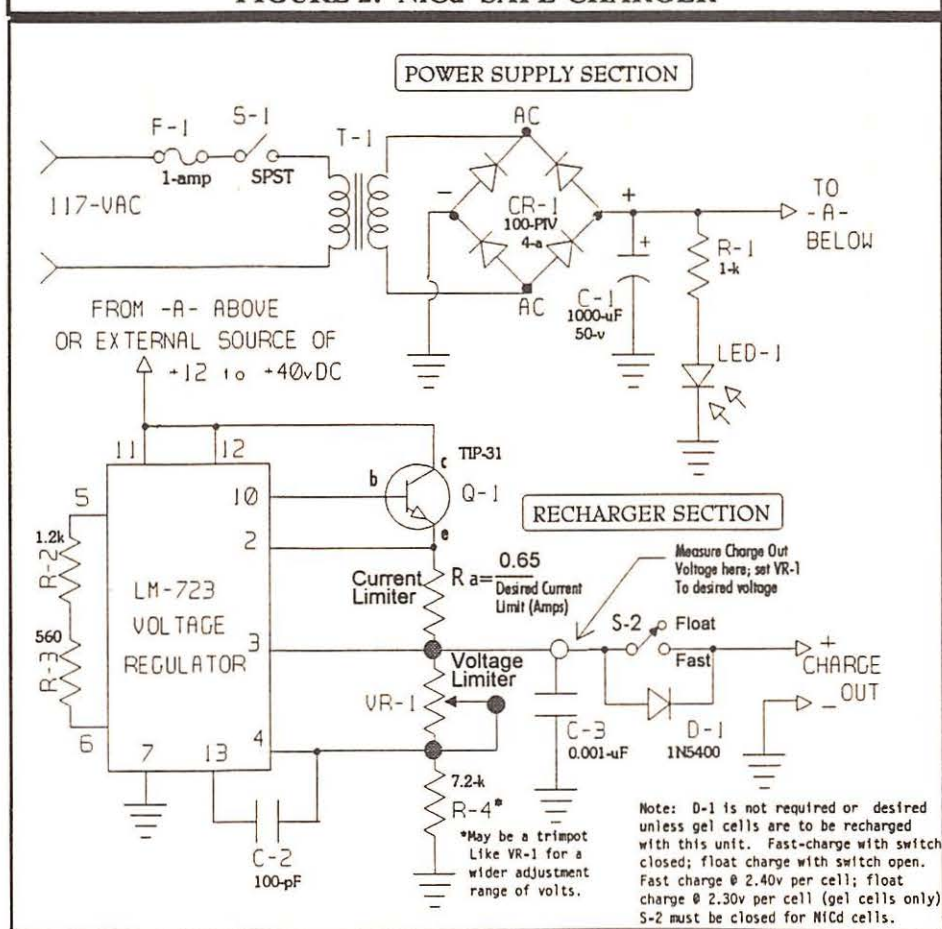
The SafeCharger features a fast/float switch with D-1 serving to drop the output voltage by 0.6-0.7 volts, just right if the charge output voltage is first set to the fast charge value. S-2 and D-1 serve no useful purpose for NiCd applications so leave them out if you don't intend to recharge gel cells and other lead-acid type batteries, too.

Incidentally, fully charged 12 v lead-acid or gel cell batteries, removed from the charger for a time, will measure 12.6-volts, and 6-volt versions will measure 6.3-volts, at full charge. Nickel-hydride cells should be treated like NiCd cells, except that their capacity is a little greater, size for size. C/3 & C/10 ratings definitely apply.

DO NOT attempt to recharge alkaline or carbon-zinc flashlight batteries with this or any other recharger. Explosion and leakage may result! See ya next month!

MT

FIGURE 2: NiCd SAFE-CHARGER





## Limited Space Antennas for HF:

### How to Make Them and Why They Work As Well As They Do

Probably all of us have had the experience of hooking just a few feet of wire to the antenna input of our HF receiver and being pleasantly surprised to find that we could receive remarkably well with such an antenna. The infamous Kurt N. Sturba has often shown that such small objects as aluminum lawn chairs and metal shopping carts can be used as antennas capable of working DX. I have written about a ham who used nothing more than a paper clip to conduct a two-way DX QSO on the 10-meter HF ham band! Bob Grove even quoted a U.S. Navy report that claimed a 6-ft. piece of wire was an adequate antenna for much HF reception. And that report was correct.

If a 6-ft wire is adequate for reception, why then do we have longer antennas? Surely the longer antennas give us something that the 6-ft wire doesn't? And, if they do, are these things worth the effort of designing, building and mounting the longer antennas?

The answer is that we do get something more from longer antennas: what that something is, depends upon the antenna. Sometimes the "something more" that we get improves reception dramatically and sometimes reception isn't improved at all by it. Let's take a look at some of the reasons why.

#### The Noise That Annoys

On the HF band and lower, we find that received noises such as atmospheric noise, man-made noise, and cosmic noise are received at levels high enough to compete with the radio signals we want to monitor. As the frequency we utilize is increased, received noise becomes less prominent and, if the frequency is sufficiently high, received noise ceases to be a problem for reception. Sometimes received noise is not a consideration for the higher frequencies of the HF band, but in general it is when receiving weak HF signals.

Consider the case when no noise is received by our antenna. Then, when we receive a signal at a level that is adequate for the sensitivity of our receiver, that signal is a readable signal. On the other hand, if a signal is present at our antenna such that its level is at or above our receiver's sensitivity level, but noise is also received, then the signal must compete with the noise. If the noise level is significant then it becomes less likely that satisfactory reception of the desired signal will occur. You can see then that the quality of reception of the desired signal depends on the ratio of that signal's level to the level of the received noise (S/N ratio).

Received signal strength is often measured in microvolts per meter and so it might seem that if we use a longer antenna to "capture more microvolts" of the signal that we should be able to receive the signal better. Unfortunately received noise can also be measured in microvolts per meter, and a longer antenna improves the reception of noise the same as it does the desired signal level. Thus the S/N ratio is not improved and we do not read the signal better even with the stronger signal level provided by the longer antenna.

#### Antenna Directionality and Gain

Longer antennas are usually more directional than short antennas and this directivity can often be of use to reduce received noise pickup if the noise is received from a different direction than the desired signal. A case in point is the Beverage or wave antenna, a very long antenna which has a high degree of directivity. The Beverage can be oriented to virtually eliminate noise and interference if the noise and interference are in a distinctly different direction from the antenna than is the desired signal.

Longer wires may also have more gain than a short wires and this gain may be helpful when the noise originates from a different direction than does the signal. In such a case the antenna can be oriented so that its directionality gives gain on the received signal but not on the noise. While the Beverage mentioned above is a very low gain antenna and works its magic strictly by its exceptional directivity, long wire antennas like the a full wavelength longwire or extended double Zepp have decent directivity and decent gain. Antennas such as these latter two can thus reduce noise from one direction while increasing received signal level from another.

Although mounting such long wire antennas to function in this fashion is sometimes done, it is difficult to do because of the length of a longwire. It is much more common to use a rotatable beam antenna such as a Yagi-Uda or quad antenna for this purpose.

#### Antenna Height

One thing that using a long wire sometimes does is allow a portion the antenna to be placed higher above ground. If the antenna is high enough, say 100 ft or higher, it may even have exposure to

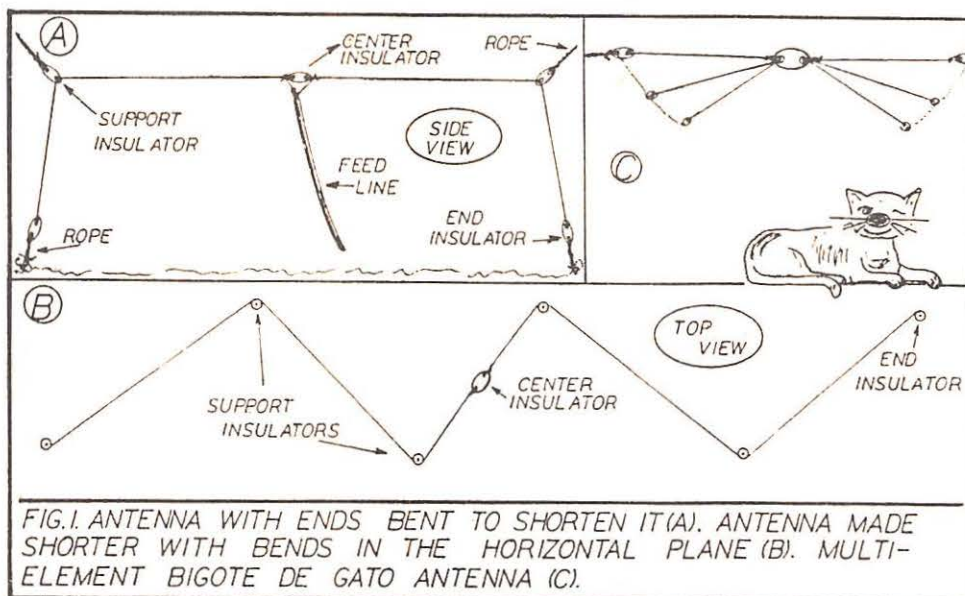
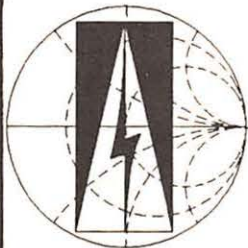


FIG.1. ANTENNA WITH ENDS BENT TO SHORTEN IT (A). ANTENNA MADE SHORTER WITH BENDS IN THE HORIZONTAL PLANE (B). MULTI-ELEMENT BIGOTE DE GATO ANTENNA (C).





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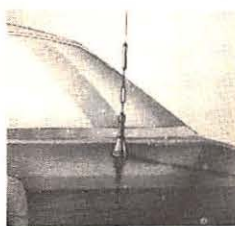
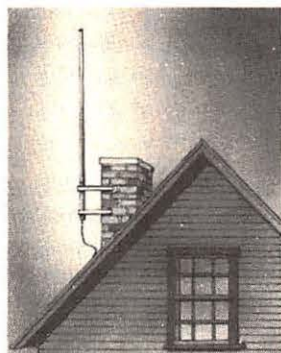
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signals to which the lower antenna has no exposure. But just raising an antenna from near ground level to roof-top height or tree-top height will often improve reception.

It is also possible to move a short wire antenna from near the receiver to a higher location by using a feedline such as coaxial cable between the antenna and receiver. This approach can not only improve signal strength due to increased antenna height but can also reduce noise pick up from the vicinity of the household wiring. Both these factors will improve the S/N ratio and lead to better reception.

## Limited Space Antenna Secrets

Thus reception of a desired signal may often be dramatically improved by use of a longer antenna if directionality, gain or height increase offered by the longer antenna is such that it improves the S/N of the desired signal. Otherwise the short antenna may be as effective as the longer one!

The secrets of effective use of limited space antennas on the HF band are that: first many signals can be received on a relatively short wire at signal strength levels sufficient for good recep-

tion; and second, that merely increasing the output from the antenna by simply lengthening it does not improve reception because the S/N ratio does not change.

## How to Make Limited Space Antennas

Trying a simple short wire attached to your receiver antenna input and hung to a tack on the wall or dropped out a window is a good start. Other common short antennas include attaching a lead wire from the antenna input of your receiver to a metal window screen, screen door, metal flag pole attached to a non-metal window frame, wire laid under a carpet, wire run along the ceiling or in a crawlspace, a metal table or even metal chair. Be creative and you can think of many more possibilities, but avoid attaching the lead wire to appliances connected to house wiring.

Conventional antenna designs can also be adapted to limited space use by such techniques as drooping the ends of a dipole (fig. 1A) or making bends in a long horizontal antenna to make it fit into a short back yard (fig. 1B).

## RADIO RIDDLES

### Last Month

Last month I asked: "Which dipole antenna is sometimes called 'bigote de gato' or 'whisker of the cat'?" Well, if you guessed the middle antenna in the bottom row of fig. 1 in last month's column you were right. In some European countries small VHF or UHF versions of that antenna, similar to the one in fig. 1C this month, are known by the Spanish name "bigote de gato" or "cat-whisker" antennas.

### This Month

So much for the cat-whisker antenna; where did we find the term "cat whisker" applied in old-time radio and where is it used in more modern radio technology?

We'll have the answer to this month's riddle and much more in next month's issue of *Monitoring Times*. 'Til then, Peace, DX, and 73.

MT



**Q.** Recently, while in Costa Rica, I rented a Nissan that had a no-brand-name shortwave radio (as well as AM/FM coverage) in its dash. I've never seen such a radio in this country; are there domestic sources other than the Phillips DC-777? (James S. Snow, D.O., Darien, GA)

**A.** The shortwave spectrum is commonly used throughout the world for domestic (local) broadcasting; not so in the U.S. It is difficult to find shortwave automotive radios in this country.

For any electronic device to be sold to consumers, it must meet FCC approval, a lengthy and costly process. Since shortwave listening is more a hobby in this country than a common utility as in other countries, few foreign manufacturers bother with the U.S. shortwave automotive market.

You might wish to try some of the larger consumer electronics shops in large cities with import harbors like New York, Miami, San Francisco, etc.). Call MT advertisers like Universal and EEB as well. They occasionally carry automotive radios.

**Q.** When I plug an outside antenna into my BC800XLT scanner, 800 MHz signals formerly heard with the attachable whip are no longer heard. Even when I insert my adjustable-gain preamplifier, it works backwards; I hear some signals with it switched off, but just garble and no clear signals when it is turned on. What's wrong? (Paul L.)

**A.** Assuming you are plugging the antenna into the right jack (remember, the BC800XLT has a separate antenna port for the 800 MHz band), and there is nothing wrong with the antenna, cable or connectors, my guess is that the system is suffering from desensitization, a design which causes the radio to become much less sensitive to avoid the consequences of overload.

**Q.** I have gone through several car radios trying to eliminate multipath flutter on my FM reception; AM reception is fine. Years ago there was a diversity radio with two front

Questions or tips sent to "Ask Bob," c/o MT, are printed in this column as space permits. If you desire a prompt, personal reply, mail your questions along with a self-addressed stamped envelope (no telephone calls, please) in care of MT.

ends fed by two antennas which addressed this problem. Is it still available? Would a tuner help? (Michael Newton, M.D., New York, NY)

**A.** FM flutter is a common problem with moving vehicles, not only on broadcasting but in two-way communications as well. It is especially critical, however, with music reception because of the resulting distortion. Many drivers have noted how a signal fades in and out when a car is moving slowly in traffic or at a stoplight; just a few inches can make a difference.

I am unaware of any dual-diversity radios or antenna accessories that are intended to address this problem. Modern autosound is concerned mostly with pre-recorded disks and tapes, not FM reception. No, a tuner won't help since the phenomenon results from reflected signals adding and cancelling at the antenna.

**Q.** How can I determine the mobile input frequencies to repeaters that I hear on my scanner? (Robert E. Keene, Prescott Valley, AZ)

**A.** You're in luck, at least on UHF signals where there really is a bandplan for repeater offsets. Mobile signals will be heard 5 MHz above the repeater frequencies in the 450-470 MHz range, 3 MHz above in the 470-512 MHz range, and 45 MHz below in the 806-896 MHz range.

Your cable system has a number of signal frequencies—sound and picture for each of the channels transmitted. That is why you are seeing a random readout on your frequency counter.

**Q.** Where can I pick up used crystals for my ancient Regency scanner? (Paul L.)

**A.** Try G&G Communications, 9241 Glenwood Dr., Le Roy, NY 14482 (ph. 716-768-8151); they

sell used crystals (hopefully they will have your frequencies) and take trade-ins, two for one.

You can also check Radio Shack; they still have crystals available for their old scanners, and they are the same I.F. (intermediate frequency) as Regency: 10.7 MHz.

**Q.** I have several pairs of old headsets with light corrosion on their plugs which causes intermittent connections in the jack. I assume I shouldn't use emery cloth to clean them; have you any suggestions? (Ed Cichorek, Somerset, NJ)

**A.** Any abrasive will remove whatever remains of the old plating. Before resorting to that, try non-abrasive silver or brass polish, spray contact cleaner, or even silicone spray lubricant.

You might even try an electrolysis process which I used years ago while restoring corroded metallic artifacts found in or near saltwater. It works great with coins and precious metals.

Place a few square inches of aluminum foil, shiny side up, in a non-metal bowl and sprinkle about a quarter-teaspoon of baking soda on the foil. Set the plug on the foil/bicarb mix. Now pour enough hot water on it to cover the corroded plug barrel while holding the cord up from getting wet. After a minute or two remove the plug and wipe it off. It should be cleaner. Repeat if needed. The silicone spray may still be necessary.

**Q.** I recently replaced my RG58/U (50 ohm) coaxial cable with RG59/U (72 ohm) and found signals to be much stronger on my scanner. I always thought that my scanner was designed for 50 ohm cable; was I wrong? (James B. Laughlan, Youngstown, NY)

**A.** A common misconception about transmission lines is that they must be correctly impedance-matched to antennas and receivers; this is a myth. Far more important is the loss characteristic of the cable.

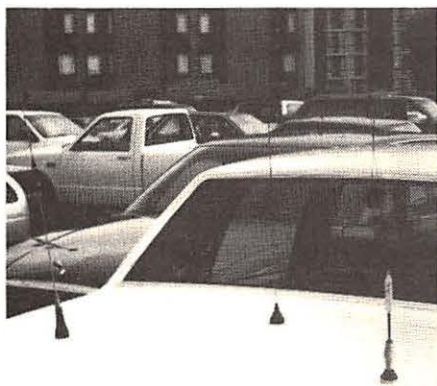
RG58/U is very lossy at VHF and especially UHF; RG59/U and, even better, RG6/U are designed for those higher frequency ranges. Always use those instead of RG58/U except for very short runs and low frequencies.

MT



## Bob's Tip of the Month

### Identifying Mobile Radio Interference



A recent conversation with a technical representative with the Ford Motor Company was most enlightening. I had been experiencing vehicle-generated noise on both my car radio and my VHF transceiver. According to the spokesman, there are several possible sources of interference.

With an independently-powered receiver (hand-held scanner, portable spectrum analyzer, portable AM/FM radio, etc.), tune in the interference and disconnect the vehicle fuses one at a time, noting whether the noise disappears.

If the noise persists even with the ignition key turned off, it could be the keyless entry system (option), anti-theft system (option), radio clock or radio memory.

If the noise is heard only with the ignition key on, it could be the processor module, ignition module, fuel pump or instrument cluster.

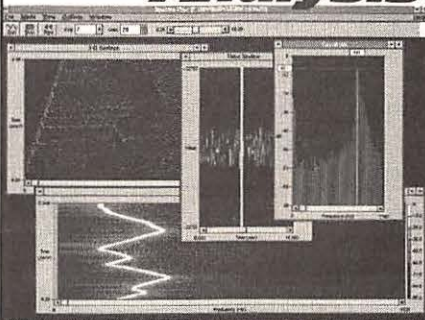
The fuel pump noise is a steady whine that may not vary in pitch with the engine RPM; a fix is available as outlined in Ford's technical service bulletin 3-15-61, and requires internal access to the fuel tank. A sure test for the fuel pump whine is to note whether the noise lasts for only a second or so after the key is first turned on without starting the engine.

Alternator whine changes pitch as engine RPM varies. Ignition noise also changes its frequency with RPM, but is recognized by its prominent "popping" sound.

Electrical motor noise from the blower or windshield wipers will only be heard when those are activated; the noise can be eliminated by installing a 0.02 microfarad, 200 volt capacitor from the +12 volt wire to ground as close to the motor as possible.

Chances are that these hints will work with other vehicles besides those manufactured by Ford.

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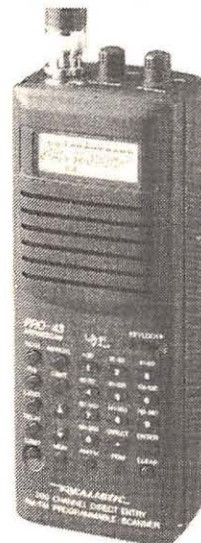
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# Club Circuit

## Welcome to ...

### Fire Net

Fire Net is an alpha-numeric paging system which informs fire buffs about current fires in the Southern California region. The net uses volunteer listeners who dispatch the information to all members of the net.

For example, you might be alerted by your pager, and read on its screen: "L.A. City has a major emergency fire at the Westwood Marche Hotel. They are working on freq 12." Naturally, you head straight to your scanner to hear all the action.

Fire net dispatchers are generally disabled and retired firefighters. There are similar groups in Boston, New York, Chicago, Mil-

waukee and Washington, D.C., and their information is shared on the net as well.

Cost is the basic paging cost (member's responsibility), plus around \$5 per month to the net to share expenses. Contact Tom Kravitz at Box 1307, Culver City, CA 90232; 310-838-1436; Compuserve 71674,1610; or Prodigy TKXD40A.

### Minnesota DX Club

Celebrating its 20th anniversary this year is the Minnesota DX Club which was founded in 1973 by a group of Twin Cities radio hobbyists to promote shortwave listening. Today their mission is still to build up the radio hobby, with

an emphasis on shortwave, mediumwave, TV, FM, and utilities monitoring.

Information is shared between members by means of the *MDXC Newsletter*, and through monthly meetings held on the 2nd Friday of the month, often at the Science Museum or the Pavek Museum of Broadcasting. The club is open to all who have an interest in monitoring. Highlights are a DXpedition in the winter, and a picnic at the August meeting.

Annual dues are \$10; expenses for special events are covered by the participants. For more information, please send an SASE to Al Sampson, 8367 Monroe St. NE, Spring Lake Park, MN 55432; 612-786-5915.

## Club Listings A-L

**All Ohio Scanner Club:** Dave Marshall, 50 Villa Rd., Springfield, OH 45503-1036. Ohio and surrounding states; VHF/UHF and some HF and amateur coverage. *American Scannergram*.

**American SW Listener's Club:** Stewart MacKenzie, WDX6AA, 16182 Ballad Lane, Huntington Beach, CA 92649, (714) 846-1685. Western US, Pacific, Asia, & Middle East; SWBC, utilities, longwave, SWL.

**Association of Clandestine Enthusiasts (A.C.E.):** Kirk Baxter, P.O. Box 11201, Shawnee Mission, KS 66207. US, Europe and Middle East; Pirate and clandestine. *The A.C.E.*

**Association of DX Reporters (ADXR):** Reuben Dagold, 7008 Plymouth Rd. Baltimore, MD 21208. International; Utilities, ham band, QSLing, MW, LW, and SWBC. *DX Reporter*.

**Association of Manitoba DX'ers (AMANDX):** Shawn Axelrod, 30 Becontree Bay, Winnipeg, Manitoba, R2N 2X9 Canada, (204) 253-8644. Manitoba; LW, MW, SW, and VHF/UHF

**Bay Area Scanner Enthusiasts:** 105 Serra Way #363, Milpitas, CA 95035. Western U.S.; 30+ MHz. *Listening Post*

**Bayonne Emergency Radio Network (BERN):** Ray Baron, P.O. Box 1203, Bayonne, NJ 07002, 201-662-2222. NE Jersey; Fire/disaster.

**Bearcat Radio Club:** Larry Miller, Box 360, Warratown, PA 19376, 1-800-423-1331. US and Canada; Scanning only. *National Scanning Report*.

**Boston Area DXers:** Paul Graveline, 9 Stirling St., Andover, MA 01810, (508)470-1971, 50 mile radius Boston; SWBC.

**British DX Club:** Colin Wright, 54 Birkhall Road, Cafford, London, SE6 1TE, United Kingdom. UK and international. SW, MW, AM, FM DXing, pirate and clandestine radio. *Communication*. Sample 3 IRCs or \$2 US cash.

**Canadian Int'l DX Club:** Sheldon Harvey, President, 79 Kippis St., Greenfield Pk., Quebec, Canada J4V 3B1, (514)462-1459. Canada nationwide/membership open to all; General coverage. *The Messenger*

**Central Florida Listeners Group:** David Grubbs, 956 Woodrose Court, Altamonte Springs, FL

32714-1261; (407) 273-5088 Andy Fountain. Central Florida; All bands. Net on 146.73 MHz Sun 8 pm.

**Central Indiana Shortwave Club:** Steve Hammer, 2517 E. DePauw Road, Indianapolis, IN 46227-4404. Central Indiana; SW broadcasting, pirates, and the offbeat. *Shortwave Oddities*.

**Chicago Area DX Club:** Edward G. Stroh, 53 Arrowhead Dr., Thornton, IL 60476. 150 mile radius of Chicago; DXing all bands. *DX Chicago*.

**Chicago Area Radio Monitoring Association (CARMA):** Ted & Kim Moran, 6536 N. Francisco 3E, Chicago, IL 60645. Chicago & midwest. Public safety & general coverage. *CARMA Newsletter*.

**Cincinnati Area Monitoring Exchange (MONIX):** Mark Meece, 7917 Third St., West Chester, OH 45069-2212. SE Indiana, Kentucky, SW Ohio; SWBC, utility, military, satellites, scanning, BCB.

**Communications Research Group:** Scott Miller, 122, Greenbriar Drive, Sun Prairie, WI 53590-1706. Wisconsin area. Scanning.

**DecalcoMania:** Paul Richards, P.O. Box 126, Lincroft, NJ 07738, (206) 356-3927 (Phil). Collecting radio related items.

**DMS-News:** Jerry Pickard, 8961 Magnolia Ave #59, Santee, CA 92071. Nationwide; VHF/UHF; *Dreaded Mod Sheet*.

**Drake SPR4 Int'l Club:** Bill Swigger, Route 142, Box 4, Bridgeport, WV 26330. Worldwide; Drake SPR4 owners.

**DX Audio Service (NRC):** NRC Publications Center, P.O. Box 164, Mannsville, NY 13661-0164. Worldwide; AM/FM; DXAS Cassette 90-min monthly audio magazine. Sample \$3 to above address

**DX Club of India:** Navin Patel, 809, M.G. Road, 1-Dutt Niwas, Mulund, Bombay-400 080, India. India; SW DXing.

**DX Club Paulista:** Marcelo Toniolo Dos Anjos, C. Postal 592, Sao Carlos - SP (Brasil), 13560-970. South America. Shortwave, including utilities. *Actividade DX* (in Portuguese).

**Finnish DX Association:** Mr. Risto Vahakainu, Suomen DX-Liitto, P.O. Box 454, SF-00101 Helsinki, Finland. Finland and worldwide. SW and BCB. *Radiomaailma*.

**Fire Net:** Tom Kravitz, Box 1307 Culver City, CA 90232, 310-838-1436. Southern California; alpha-numeric paging fire notification net, tied in with nationwide net.

**Friendship DXers Club:** Ing. Santiago San Gil Gonzalez, C.DX.A - International, P.O. Box 202, Barinas 5201-a, Estado Barinas, Venezuela. International. DXing all bands. Cadena DX, YV-2-FSW, Sunday 1130-1330 UTC on 7113 and 14113 kHz. Membership free.

**Houston Area Scanners & Monitoring Club:** 909 Michael, Alvin, TX 77511, (713) 388-1941. 75 mile radius of Houston, TX; scanning & SW.

**Int'l Radio Club of America (IRCA):** Ralph Sanserino, P.O. Box 70223, Riverside, CA 92503. Worldwide; BCB/AM DX. *DX Monitor*.

**Long Island Sounds:** Ed, 2134 Decker Ave, North Merrick, NY 11566. Public Safety. Net Tues 8pm 146.805. *Newsletter*.

**Longwave Club of America:** Bill Oliver, 45 Wildflower Rd., Levittown, PA 19057, (215)945-0543. Worldwide; Longwave only. *The Lowdown*.

## New Listings:

**Capitol Hill Monitors:** Alan Henney, 6912 Prince Georges Ave, Takoma Park, MD 20912-5414, (301) 270-2531. DC, MD, No. VA, So. DE. Scanner bands. *Capitol Hill Monitor*.

**New Zealand Radio DX League:** P.O. Box 3011, Auckland, New Zealand. MW, SW, FM, TV. *New Zealand DX Times*.

**New Zealand DX Radio Association:** Mr. R. Dickson, 88 Cockerell St., Brookville, Dunedin, New Zealand. MW, SW, amateur and utilities. *Tune-In*.

**DX Australia:** P.O. Box 422, Moonee Ponds, Victoria 3039, Australia. MW, SW. *DXers Calling*.

**Rocky Mountain Monitoring Enthusiasts** is being disbanded to form the following club:

**Mountain NewsNet:** James Richardson, P.O. Box 621124, Littleton, CO 80162-1124, (303) 933-2195. Colorado statewide. Public Safety notification group.



## SPECIAL EVENT CALENDAR

Date	Location	Club/Contact Person
Nov 5-7	Houston, TX	West Gulf Division ARRL Convention/Richard Shankle, N5KV 203 Arrow Wood, Lake Jackson, TX 77566.
Nov 6	Greenfield, WI	Milwaukee Repeater Club Friendlyfest '93 P.O. Box 37991, Milwaukee, WI 53237-0991. Location: St. John the Evangelist Church, \$5 admission, 7am-12pm, talk-in on 146.52/146.910.
Nov 6-7	Lawrenceville, GA	Alford Memorial ARC/P.O. Box 3100, Lithonia, GA 30058, (404) 985-8750. Location: Gwinnett County Fairgrounds, Saturday 9-5, Sunday 9-3:30
Nov 7	Sun Prairie, WI	Communications Research Group Meeting from 12:00-6:00 pm.
Nov 13	Myrtle Beach, SC	Myrtle Beach Hamfest/Grand Strand ARC, Web Williams, KD4CQK (803) 293-7888. Location: Myrtle Beach HS.
Nov 13	West Monroe, LA	Twin City Hams/Jimmy Ramsey, N5DMX 103 West Fairway Dr., West Monroe, LA 71291.
Nov 13-14	Ft. Wayne, IN	Indiana State ARRL Convention/Don Gagnon, WB8HQS P.O. Box 10342, Fort Wayne, IN 46851.
Nov 20-21	Tampa, FL	Suncoast ARC Convention/William Holcomb, KC4YTP P.O. Box 2423, Clearwater, FL 34617-2423, (813) 837-4533. Location: Florida State Fairgrounds
Nov 21	Washington, PA	Washington Amateur Communications, Inc. Hamfest Ted Lockman, WB3BZK, (412) 222-6473. Location: Chartiers-Houston HS. \$3 admission, talk-in on 145.49.
Nov 27	Litchfield, IL	Central IL/St. Louis Area ATV Club Banquet will be held at the Ariston Restaurant. Call (217) 532-3837 for more information.
Nov 28	Wheaton, IL	GMRS of Illinois Winterfest '93 2077 West Roosevelt Road, Wheaton, IL 60187; (708) 690-1492 Location: Dupage County Fairgrounds, 8am-1pm, \$5 admission, talk-in on 146.52.
Dec 4	Grayslake, IL	CAP Late Fall Hamfest 15220 West Redwood Lane, Libertyville, IL 60048. Location: Lake County Fairgrounds Route 45 & 120, 7am-??, \$3.50 admission.
Dec 4	No Olmsted, OH	North Coast ARC/Dan Sarama, KB8A, (216) 267-5083 Location: St. Clarence Church, 8am-2pm, \$3 admission, talk-in on 145.29 and 224.76 repeaters.

Monitoring Times is happy to run brief announcements of radio events open to our readers. Send your announcements at least 60 days before the event to:

**Monitoring Times Special Event Calendar,**  
P.O. Box 98, Brasstown, NC 28902-0098

## DX RADIO TESTS

The International Radio Club of America (IRCA), is a club devoted to the hobby of hearing distant stations on the standard AM broadcast band. For more information, write to: IRCA, 11300 Magnolia #3, Riverside, CA 92505, USA. This month's (as well as October's) tests were arranged by J.D. Stephens for IRCA.

**Monday, November 1, 1993: WDLN-960**, P.O. Box 149, East Moline, IL 61244, will conduct a DX test between 1:00 and 1:30 am EST. The test will include Morse code, tones, voice IDs, and march music. Reception reports may be sent to: Mr. Glenn Rogerson (WD9IWO), Chief Engineer.

**Monday, November 1, 1993: WSSH-1510**, Woburn, MA, will conduct a DX test between 3:00 and 4:00 am EST. The test will include Morse code, tones and voice IDs. *Power will be 50 kW.* Thanks to Mr. Michael J. Klein, NV1L, General Manager, for this test. Mr. Klein requests that reception reports be sent to: WSSH DX Test, 2616 Meadow Ridge Drive, Duluth, GA 30136-6037.

**Saturday, November 6, 1993: KFJM-1370**, P.O. Box 8116, Grand Forks, ND 58202-8116, will conduct a DX test between 1:00 and 1:30 am EST. The test will include Morse code, rhythm and blues music, and voice IDs. Reception reports may be sent to: Mr. John Ashen, Director of Engineering.

**Saturday, November 6, 1993: KREW-1210**, P.O. Box 149, Sunnyside, WA 98944, will conduct a DX test between 3:00 and 3:30 am EST. The test will include Morse code, tones, and march music. Reports may be sent to: Mr. Don Bennett, W7IVE, Chief Engineer.

**Monday, November 15, 1993: KDAL-610**, 425 West Superior, Duluth, MN 55802, will conduct a DX test between 1:00 and 1:30 am EST. The test will include Morse code and voice IDs. Reception reports may be sent to: Mr. Mike Langevin, Operations/Program Manager.

**Monday, November 15, 1993: WXYT-1270**, 15600 W. 12 Mile Road, Southfield, MI 48076, will conduct a DX test between 1:30 and 2:00 am EST. The test will include Morse code and voice IDs. Reception reports may be sent to: Mr. Neil T. Schwanitz, WD8CRT, Chief Engineer.

**Monday, November 22, 1993: WFIF-1500**, 90 Kay Avenue, Milford, CT 06460, will conduct a DX test between 5:30 and 6:00 am EST. The test will include Morse code, tones and religious music. Reception reports may be sent to: Mr. William Barnett, N1NIKM, Chief Engineer.

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## Shortwave Listening in the Classroom

I am developing a teaching unit that introduces shortwave, or world band radio, in the elementary school classroom as an exciting, hands-on listening center that integrates media studies with other subjects across the curriculum. I would be pleased to hear from you if you are a teacher, or know of a teacher, that uses shortwave listening in the classroom. My interest is to establish an international network of teachers that use shortwave in their classrooms for teaching about media studies, global perspectives, world geography, social studies and other subject areas. Please write if you would like to share your ideas and experience with other teachers. Neil Carleton, P.O. Box 1644, Almonte, Ontario, K0A 1A0, Canada. Grade 5 teacher. CIDX and ODXA member. NASWA editor of the *Radio Stamps* column. Host of the *Radio Stamps* shortwave program heard on the DX Partyline of HCJB, the Voice of the Andes, in Quito, Ecuador.

buck' because it is chock full of information. One can read your magazine without feeling like a 'radio nerd.'"

W.E. Frank, Edmonds, WA

"It was an absolute delight to read John D. Stephens' beautiful article about WEWN shortwave radio. As a Catholic, I appreciate your carrying WEWN and Vatican Radio frequencies. By the way, we've been enjoying our shortwave radio programming on an American Electrola since December 1992. We were fortunate to be in the very first batch; I have radio #44."

Elaine Payne, Bessemer City, NC

Apropos of the Transoceanic article in this month's "Radio Reflections": "I have been lucky enough to have owned a 'Transoceanic' which my father bought for me, since 1964. True, some of the sensitivity has faded, but I still enjoy collecting QSLs from overseas stations. This unit holds a place of honor in my shack!"

Leo White, Philadelphia, PA

By the way, your editor is also now the proud owner of a Zenith Transoceanic "Bomber," circa 1938. It's non-functional at the moment, but after reading all the raves, I couldn't pass up this beauty when it appeared at a local yard sale. It seemed like a constructive project for the winter months, and a way to get just a little feel for the "good old monitoring times."

Rachel Baughn,  
Editor

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## High Tech in Low Orbit:

### *The Emerging Personal Communications Service*



The influential Cellular Telecommunications Industry Association (CTIA) now has an adversary. PCS Action, a consortium of Personal Communications Service providers, wants to bar cellular operators from PCS participation.

The FCC has allocated 220 megahertz of spectrum between 1850 and 2100 MHz (1.85-2.1 GHz) for emerging technologies; more than half of this spectrum will be awarded to the PCS.

The National Telecommunications and Information Agency (NTIA) of the Department of Commerce agrees at least in part with PCS Action; they want to forbid cellular interests from bidding on large PCS licenses anywhere cellular already exists.

In the meantime, Motorola, a powerful cellular player who sees the handwriting on the wall, has searched around the globe to find launching platforms for their proposed galaxy of 66 low-earth orbiting (LEO) Iridium satellites. Since the satellites require insertion into a polar orbit, Kennedy Space Center is out of the running.

Motorola claims that PCS satellites could be launched as early as 1996 from Vandenberg Air Force Base using McDonnell-Douglas Delta II launchers; from Baikonur Cosmodrome utilizing Russian Proton vehicles made by Khrunichev



*PCS offers room to roam in the Tampa area, which is testing out the system.*

Photo courtesy of GTE

*OKI's special PCS telephones.*



Photo courtesy of GTE

Enterprises; and from China using Long March 2 rockets made by Great Wall Industry Corporation.

Once in operation, Motorola plans to offer portable, solar powered phone booths and small radiotelephone handsets on 1.6 GHz for global coverage, even from remote areas. Raytheon Corporation will supply the large, phased-array, uplink antennas for the project.

The flat-panel arrays can provide 48 radio beams per satellite, each beam capable of carrying as many as 100 simultaneous phone calls. Subscribers are expected to utilize the service for voice, facsimile, video and data.

The satellites will also intercommunicate on 24 GHz crosslinks, as well as with worldwide ground stations.

Motorola admits that they must be cost-competitive with emerging terrestrial (land-based) PCS systems to be successful. Their \$3.4 billion investment is expected to cost users \$3 per minute plus a \$50 monthly service fee.

Motorola is also developing dual-mode handsets to allow the Iridium network to link with conventional cellular systems as well.

Developments in our high-tech society are accelerating at a dazzling rate. A glimpse into the not-too-distant future would probably reveal unrecognizable TV sets, portable phones, home computers and other accouterments of our daily lives. *MT* will continue to bring you the latest information about our intercommunicating world.





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